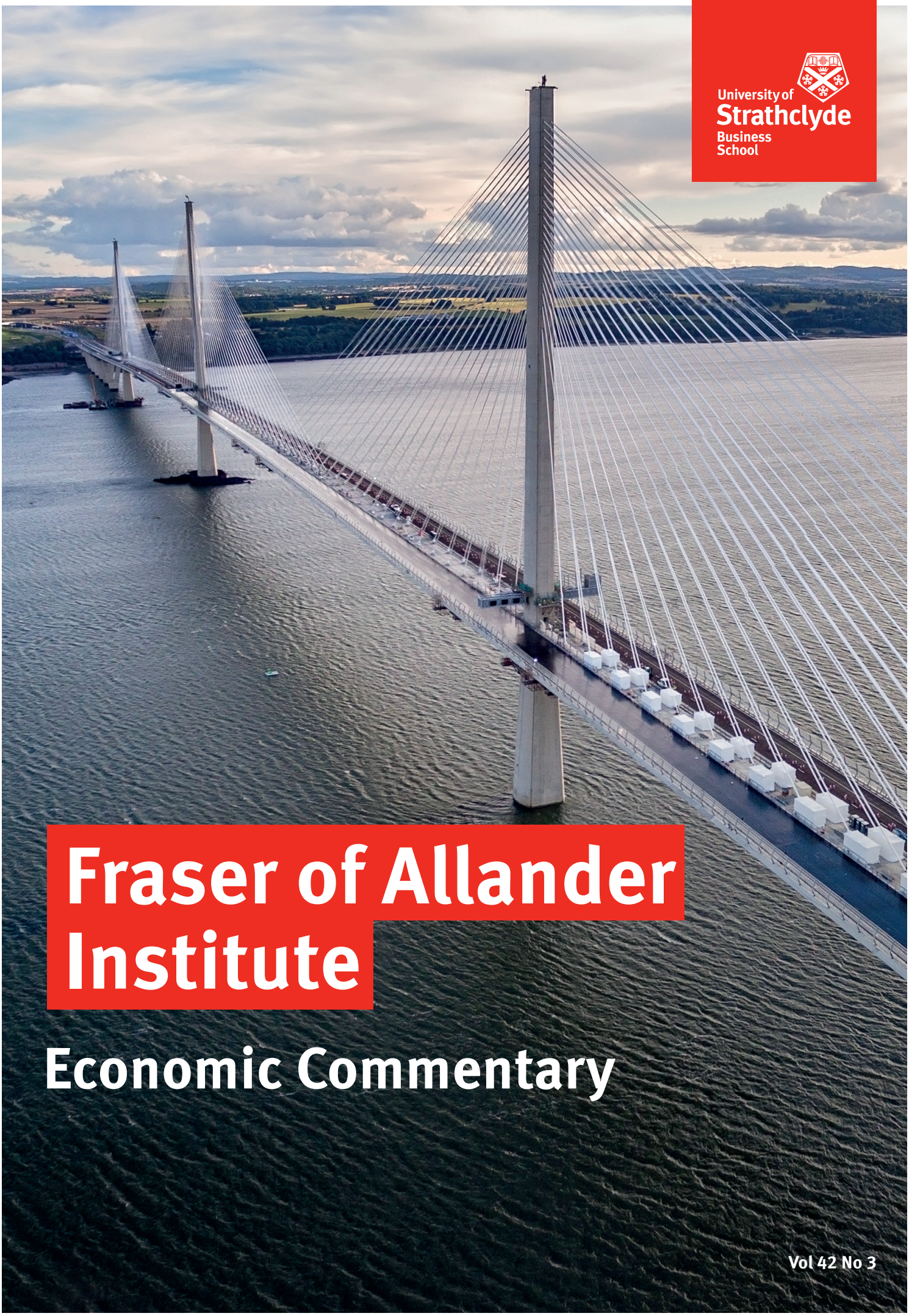

University of Strathclyde Business School

Fraser of Allander Institute

Economic Commentary

Vol 42 No 3

Fraser of Allander Institute

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For regular analysis on the Scottish economy and public finances please see our blog

www.fraserofallander.org

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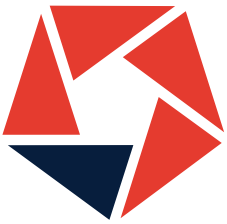

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Summary

After a sustained period of weak growth and despite ongoing political uncertainty, the Scottish economy has been showing some signs of strengthening.

This trend has continued over the summer.

As we discussed in our last commentary, in recent months we have seen evidence of a short-term pick-up in the rate of economic growth in Scotland.

Growth over the year to June 2018 – whilst still below average – was the fastest since late 2014/ early 2015 and the Scottish economy has outpaced the UK for the last two quarters.

While we remain cautiously optimistic, growth is likely to remain below trend for the duration of our forecast horizon.

And overall, the immediate outlook for Scotland's economy remains highly uncertain.

On the one hand, wages across the UK have started to pick-up, whilst the global economy remains in strong health which should boost Scottish exports.

Tourism numbers continue to go from strength to strength. And the majority of measures of business confidence we track have been on the rise, albeit from very low levels.

On the other hand, despite being less than six months from the UK leaving the EU, the lack of clarity on the UK's future relationship with its largest external market continues to cast a shadow over the outlook.

As a result, whilst we are forecasting – in our base case – growth of 1.3% this year and 1.4% in 2019 and 2020, we would stress the heightened degree of uncertainty around such point estimates at the current time.

Our forecasts are based upon a broad-based agreement between the UK and the EU. Should this not happen, then our forecasts are likely to change significantly. With so many different factors – both economic and political – about what a 'no-deal' may look like, we have not forecast this scenario at this stage. An update will be provided in December when more details are known.

As we have argued before, in our view, a 'hard-Brexit' would act as a significant drag on Scotland's – and the UK's – economic potential.

Many of the impacts, such as weakened supply chains, reduced flow of skilled workers, trade barriers, and lower levels of international investment will set in gradually.

However, it is the risk of a 'no-deal' scenario that is of most concern in the immediate term. Whether you agree or disagree with the decision to leave the EU – or the final agreement the UK should negotiate with the EU – the need for an orderly transition is vital.

As both the Chancellor of the Exchequer and the Governor of the Bank of England have agreed, a 'no-deal' outcome would cause hardship for many firms, workers and families across the UK.

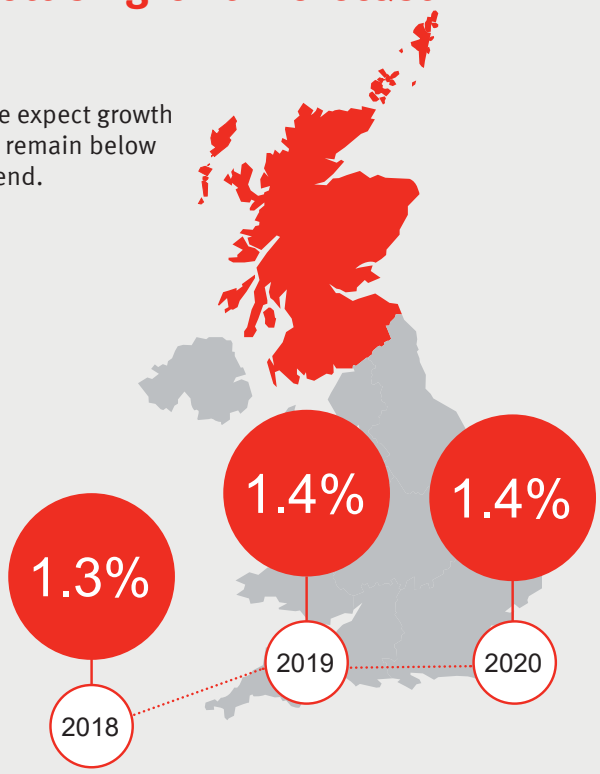
Sleepwalking into a 'no-deal' outcome cannot be viewed as an effective economic plan.

Now is the time for effective and strong leadership from all our political leaders.

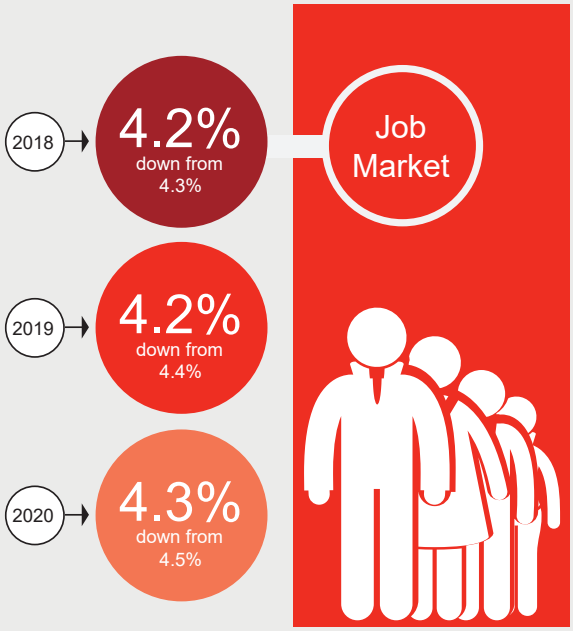
Fraser of Allander Institute
September 2018

Scottish growth forecast

We expect growth to remain below trend.



Unemployment forecast



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At a glance

Chart: Scottish growth (since 2013) – year and quarter

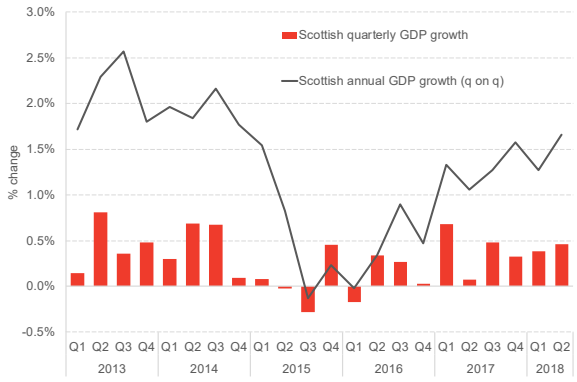

Chart: Employment & unemployment rates, May - July 2018

	Employment (16-64)		Unemployment (16+)	
	Rate (%)	Year Change	Rate (%)	Year Change
Scotland	75.1%	▼	4.1%	▲
England	75.8%	▲	4.0%	▼
Wales	74.8%	▲	3.8%	▼
N. Ireland	69.3%	▲	4.0%	▼
UK	75.5%	▲	4.0%	▼

Chart: FAI forecast Scottish economic growth range

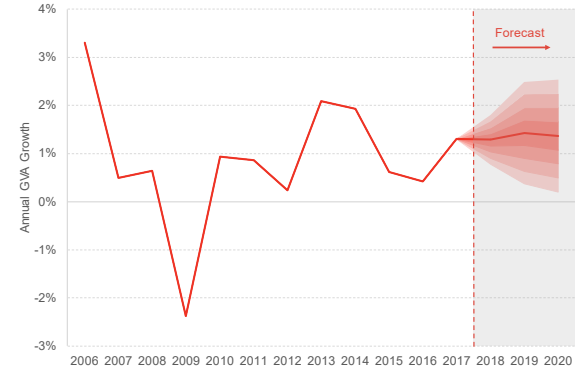

Table: FAI forecast Scottish economic growth (%), 2018 – 2020

	2018	2019	2020
GDP	**1.3%**	**1.4%**	**1.4%**
Production	1.5%	1.6%	1.5%
Construction	1.0%	1.1%	1.0%
Services	1.2%	1.4%	1.3%

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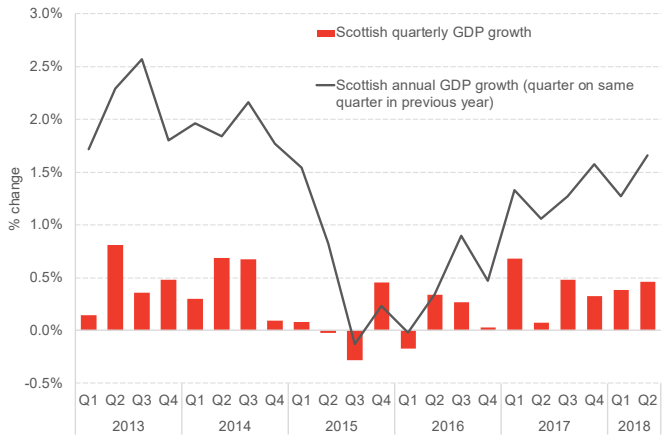
Outlook and Appraisal

As we argued back in June, there have been welcome signs of a gradual pick-up in activity in the Scottish economy after a sustained period of weak growth. Indeed, the most recent data point to Scotland's economy outpacing growth in the UK as a whole. These figures are clearly welcome, although below the surface businesses are becoming increasingly worried about the costs of a 'no-deal' Brexit.

Chart 1: Scottish growth since 2013, year and quarter



Source: *Scottish Government & FAI calculations*

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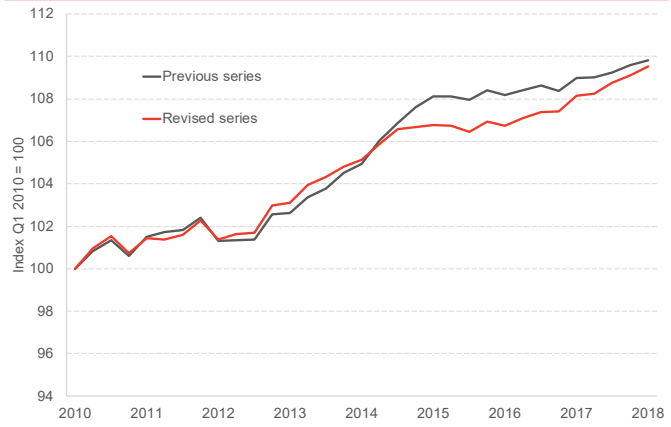
UK	75.5%	▲	4.0%	▼

Source: *ONS*

Chart 2: Scottish economic growth revisions, 2010 — Q1 2018



Source: *Scottish Government & FAI calculations*

Introduction

The Scottish economy grew by 0.5% in the 3-month period to June 2018 – ahead of the UK for the 2nd consecutive quarter. (Chart 1 and Chart 2)

Growth over the year was the fastest since late 2014/early 2015. Revisions for 2016 and 2017 lifted the official growth estimates much closer to our own forecasts. (Chart 3)

As outlined in June, we are slightly more optimistic about Scotland's near-term economic prospects than this time last year.

On balance, our central view is that the Scottish economy is showing greater signs of resilience.

Why?

First, whilst there is undoubtedly heightened uncertainty around Brexit, many businesses appear to be 'looking-through' such concerns and are getting on with day-to-day activities. But this is clearly fragile. And the apparent lack of contingency planning by many firms is a significant concern.

Second, the outlook for oil and gas – and its all-important supply chain – remains more positive than it has been in almost three years.

Third, there are signs that the recent upturn is relative broad-based with most sectors currently posting positive returns.

We forecast that growth will continue at around its current pace for the next 2 to 3 years.

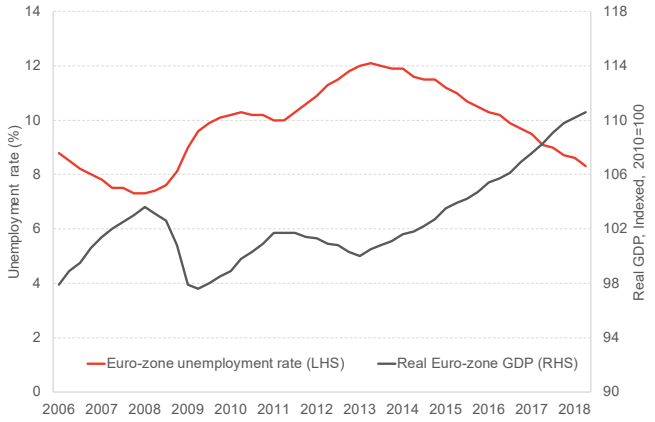
Of course, some of this upturn is cyclical and follows a sustained period of weak growth. The greatest risk to this forecast is from a no-deal Brexit. Whilst not sharing some of the concerns of the most pessimistic commentators regarding the potential negative hit to the economy should this happen, we do think that a cliff-edge scenario would have serious short-term – and long-term – negative consequences for the Scottish economy.

Table 2: IMF forecasts for growth (%), 2017 (outturn) to 2019

	2017*	2018	2019
UK	1.7	1.4	1.5
US	2.3	2.9	2.7
Japan	1.7	1.0	0.9
Canada	3.0	2.1	2.0
Euro Area	2.4	2.2	1.9
Germany	2.5	2.2	2.1
France	2.3	1.8	1.7
Italy	1.5	1.2	1.0

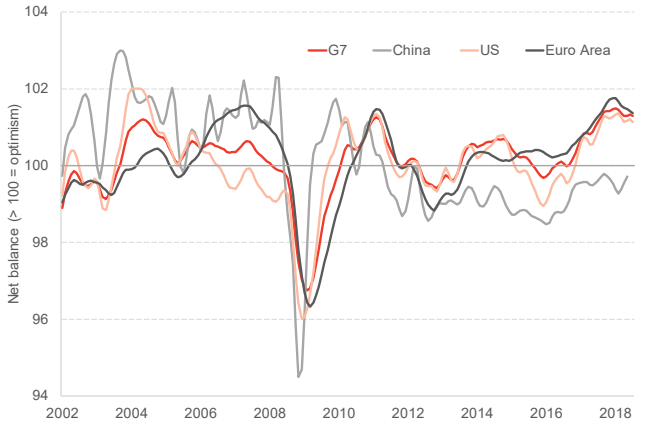
*Outturn. ***Source:*** *IMF*

Chart 3: Euro-zone unemployment rate and real GDP since 2006



Source: *Eurostat*

Chart 4: Business confidence in the UK's major markets



Source: *OECD*

The global economy

Whilst the pace of growth in the world economy has slowed slightly, particularly in emerging economies, the outlook remains robust.

Most predictions are for world growth to continue to be close to, or slightly above, average over the next couple of years. (Table 2)

The slight easing in world growth seems to reflect a movement toward a more balanced type of growth, rather than a more significant slowdown.

There has been a gradual shift toward more sustainable drivers of growth such as trade, investment and wages across most major economies.

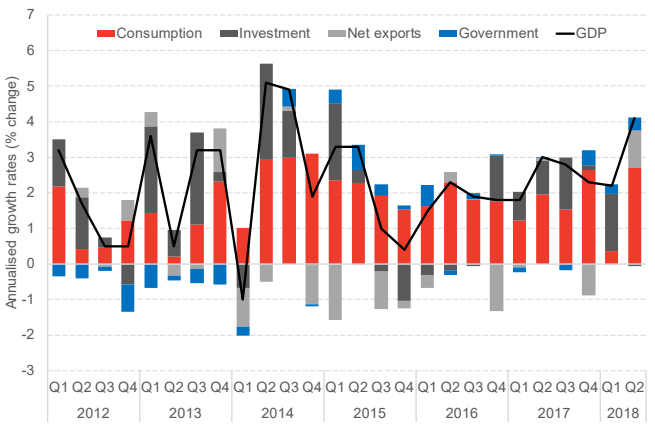
At the same time, some structural problems – such as unemployment in Europe – whilst still significant, continue to be slowly addressed. (Chart 3)

Overall sentiment and demand in Europe remains high and well ahead of the UK. (Chart 4)

Across the Atlantic, the US continues to power ahead driven by more confident households and increasing investment. President Trump's tax cuts have helped to provide a significant fiscal stimulus. (Chart 5). US unemployment is on track to fall to its lowest rate in around 50 years.

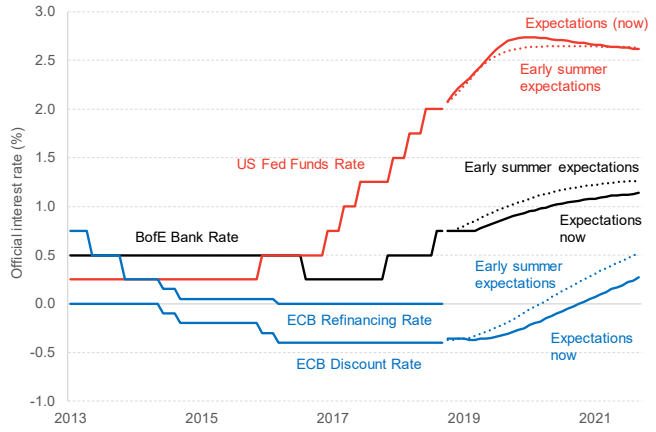
Without Brexit, such factors would be pointing toward a highly positive outlook for Scottish exporting firms over the next few months.

Chart 5: Contributions to US growth, Q1 2012 — Q2 2018



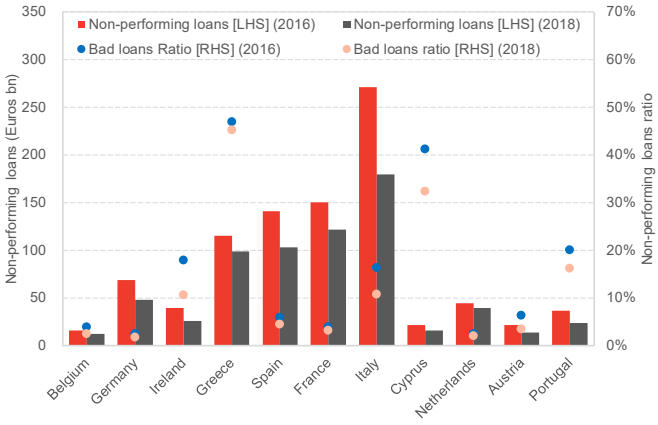
Source: *U.S. Bureau of Economic Analysis*

Chart 6: Policy rates in UK, US and Europe, 2013 — 2021



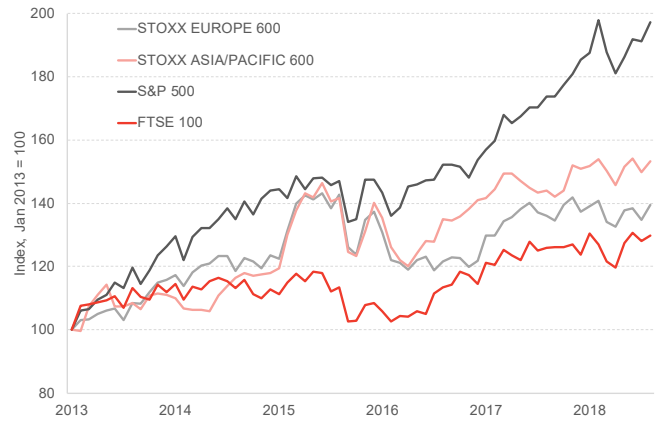
Source: *Thomson Reuters Datastream & FAI calculations*

Chart 7: Bad loans in Europe, 2016 and 2018



Source: *European Central Bank*

Chart 8: Stock market indices, Jan 2013 — Aug 2018



Source: *Thomson Reuters Datastream*

Of course, there are risks to this outlook.

The Trump administration's decision to increase tariffs on some European and Chinese imports, has escalated trade tensions.

The short-run impact of a trade war may be more modest than one might expect (relative to the geo-political consequences). But the potential damage to long-run prospects for growth is a concern.

The strength of global growth has led to increased speculation about a gradual return to normality in interest rates. (Chart 6)

The US Fed increased rates by 25 basis points in June, with two further hikes pencilled in for 2018. The ECB plans to taper its QE programme, marking the first step in the unwinding of its emergency support efforts.

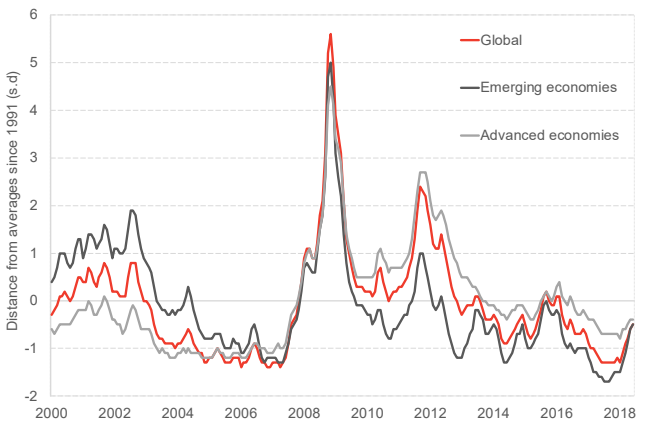
But a combination of fiscal consolidation, weak productivity, bad loans – Chart 7 – and demographics is likely to mean that the 'neutral interest rate' in most economies will remain lower than pre-crisis averages for at least a decade.

Equity prices have bounced back following their correction in February. Volatility has subsided and risk appetite has been strong. (Chart 8)

Consequently, overall financial conditions have remained highly supportive.

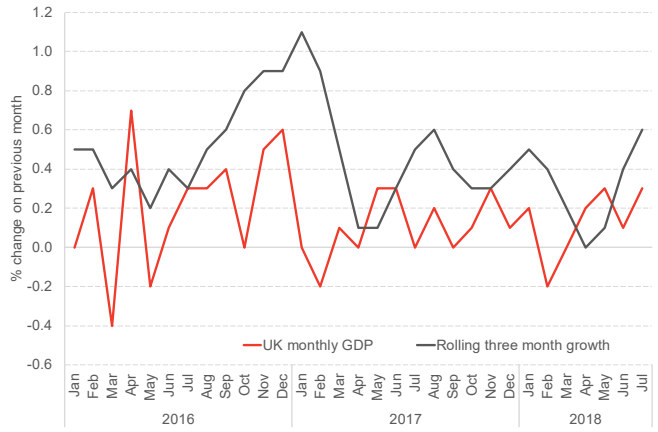
Our colleague Gary Koop has co-developed a financial accounting index which draws on data such as equity, corporate bonds and interbank spreads. It shows general financial conditions remain highly supportive. (Chart 9)

Chart 9: Koop and Koroblis Financial Conditions Index, 2000 — 2018 (values ‹ 0 = supportive, values › 0 = restrictive)



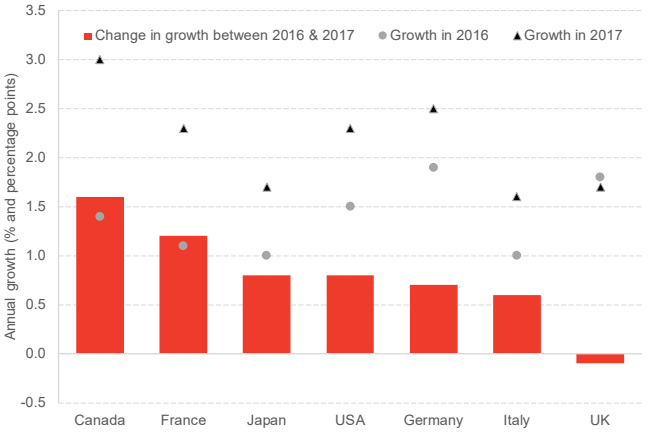
Source: *Bank of England*

Chart 10: Monthly UK economic growth to July 2018



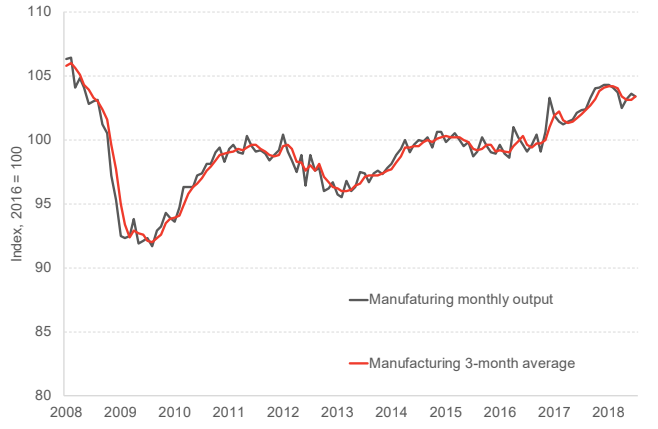
Source: *ONS*

Chart 11: Annual GDP growth in G7 countries, 2016 – 2017



Source: *ONS & OECD*

Chart 12: UK manufacturing output, Jan 2008 — Jul 2018



Source: *ONS*

The UK economy

For the first time, in July the ONS published UK GDP on a monthly and rolling 3-monthly basis.

The results require careful interpretation.

Firstly, the latest UK figures might not always follow the 'traditional' calendar quarters of Q1, Q2 etc. So growth comparisons – including with Scotland – need to ensure a like-for-like basis. Secondly, month-to-month results will be volatile. (Chart 10). One-off events – e.g. weather – could have significant impacts on the headline results.

Up to July, rolling 3-month growth of 0.6% was the highest since last summer.

This pick-up follows a challenging start to 2018, and weak growth through 2017, when the UK lagged behind other G7 economies. (Chart 11).

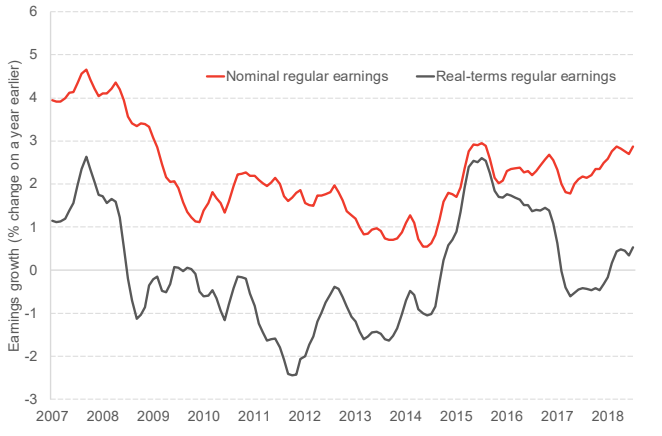
Within sectors, performance has been mixed. Manufacturing output fell over both the quarter and the year.

With manufacturing activity still lower than a decade ago, any hope of boosting exports substantially – and to the government's target of 35% of GDP – is hugely optimistic. (Chart 12)

A strong performance from consumer facing activities, driven by factors such as the good weather, boosted the summer growth numbers.

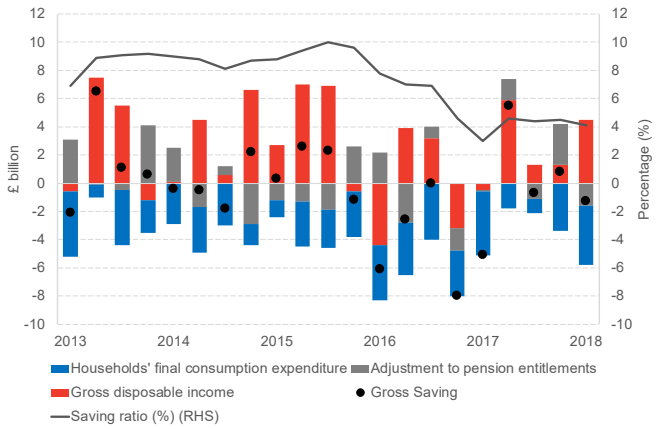
The growth in consumer activity has also been boosted by an upturn in real earnings. But conditions remain challenging for many in the sector. Over the year to July, real terms regular earnings increased by 0.5%. (Chart 13)

Chart 13: Real and nominal earnings growth, Jan 2007 - Jul 2018



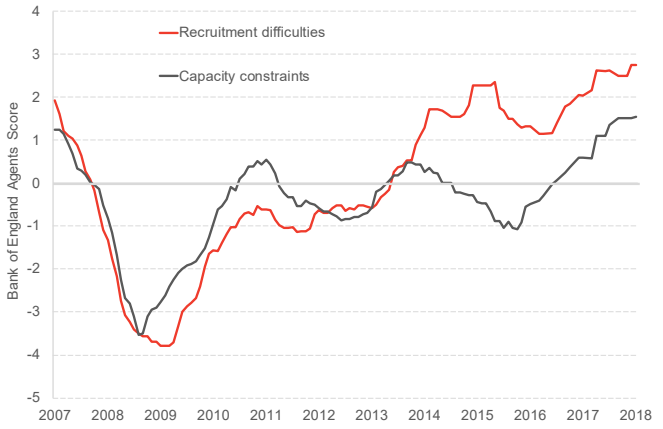
Source: *ONS*

Chart 14: Contributions to the UK savings ratio, 2013 — 2018



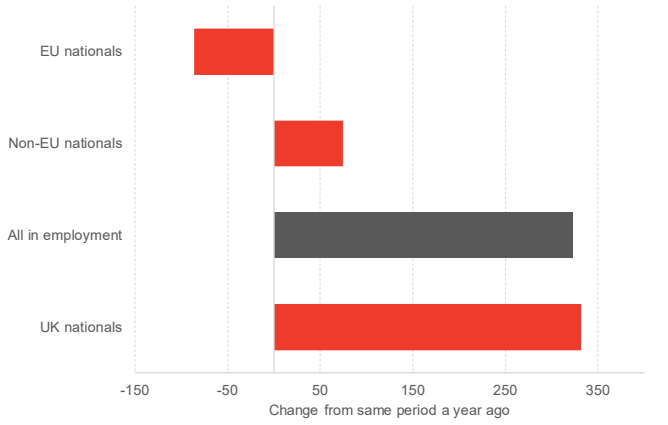
Source: *ONS*

Chart 15: Bank of England Agent Scores: capacity constraints & recruitment difficulties since August 2007



Source: *Bank of England*

Chart 16: Change over year in employment by nationality, Apr-Jun 2017 — Apr-Jun 2018



Source: *ONS*

That being said, average regular pay remains around £11 per week lower than prior to the financial crisis – and over £30 less when bonuses are included.

As a result of this squeeze, the UK savings ratio (the proportion of income not spent each quarter) is at its lowest level in over 50 years. (Chart 14)

Some of the rise in wages is undoubtedly driven by the tight UK labour market.

Unemployment of 4 per cent is the lowest since the winter of 1974-75.

Whilst welcome, there is increasing evidence that this is posing recruitment challenges and wider capacity constraints. (Chart 15)

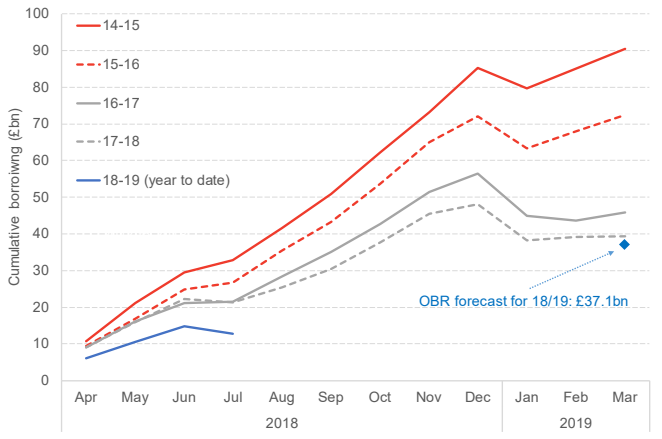
The number of people in work continues to grow, but there is also evidence of a fall back in the number of EU nationals in employment in the UK. (Chart 16)

Whether or not this is part of a 'Brexit effect' remains unclear. Reports from the Bank of England's network of agents suggests that companies are becoming more uncertain about the outlook, with a fall-back in investment intentions. Contingency planning, whilst modest, is intensifying.

This backdrop of fragility – albeit counterbalanced by positive indicators of current activity – will set the context for the upcoming 2018 UK Budget.

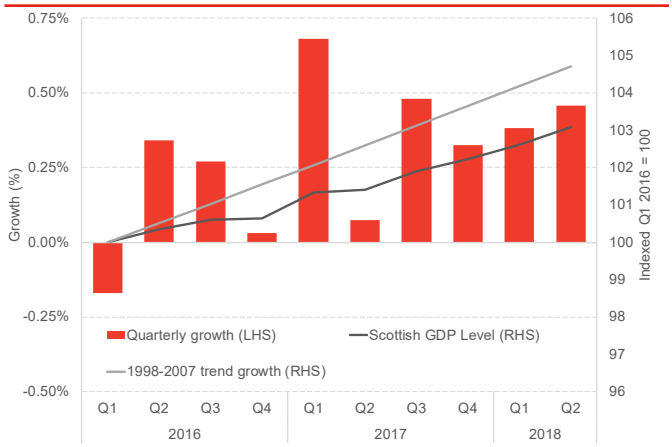
Whilst borrowing continues to fall (Chart 17), with debt still above 80% of GDP, and rising pressures on health and social care costs, the Chancellor does not have his challenges to seek.

Chart 17: UK public sector net borrowing by financial year, 2014/15 to 2018/19



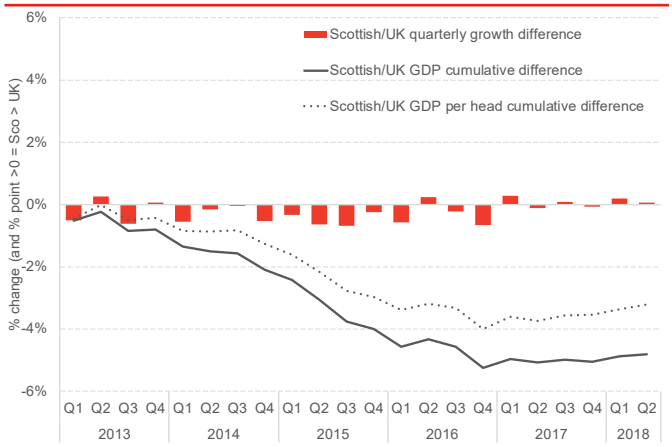
Source: *OBR*

Chart 18: Scottish GDP since 2016



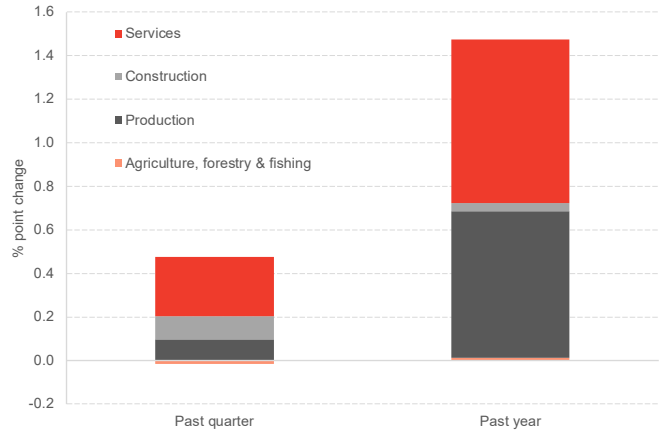
Source: *Scottish Government & FAI calculations*

Chart 19: Scotland vs. UK economic growth since 2013



Source: *Scottish Government & FAI calculations*

Chart 20: Composition of growth over year and latest quarter



Source: *Scottish Government & FAI calculations*

The Scottish economy

The latest Scottish GDP growth figures were published last week (19th September). (Chart 18)

They showed a further pick-up in growth, with the Scottish economy expanding 0.5% over the 3-months to June. This followed revised growth of 0.4% in the first 3-months of the year.

These figures (consistent with the latest survey indicators) show further evidence of the first sustained period of expansion since the downturn in early 2015. Indeed, growth over the year to June 2018 was the fastest since late 2014/early 2015.

That being said, annual growth of 1.7% (quarter-to-quarter) and 1.4% (4Q-on-4Q), still lags Scotland's long-term historical growth rates.

The Scottish economy has outpaced the UK for the last two quarters and over the year as a whole.

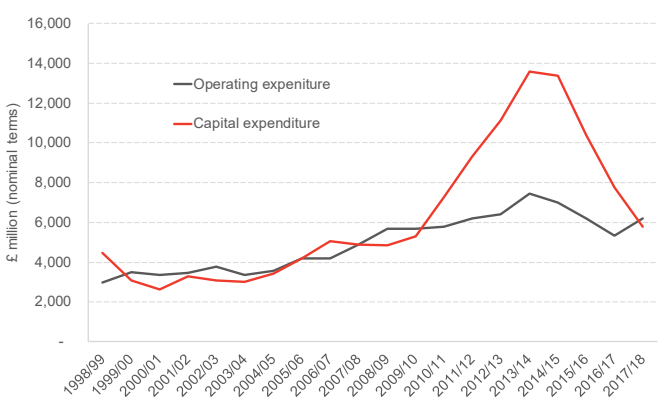
Some of this, reflects a degree of cyclical catch-up, with the UK having grown more strongly over the four years to late 2016, shown in Chart 19.

But the upturn has been broad-based. Over Q2, there was growth of 0.6% in production activities, 1.8% in construction and 0.4% in services.

With services making up over 75% of activity – it is no surprise that Scotland's overall rate of growth has been shaped by services. (Chart 20)

Some of the improvement in the Scottish numbers undoubtedly reflects a more positive outlook for oil and gas than last year – albeit cutbacks continue to be made. (Chart 21)

Chart 21: Capital and operating expenditure in the North Sea, 1998-99 to 2017-18

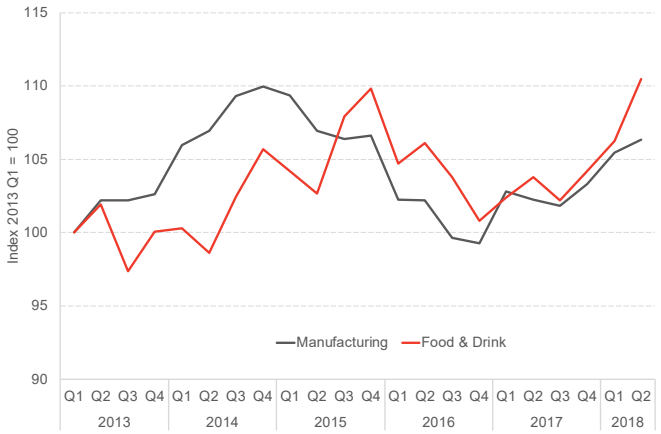


Source: *Scottish Government & FAI calculations*

Scottish Economy Dashboard

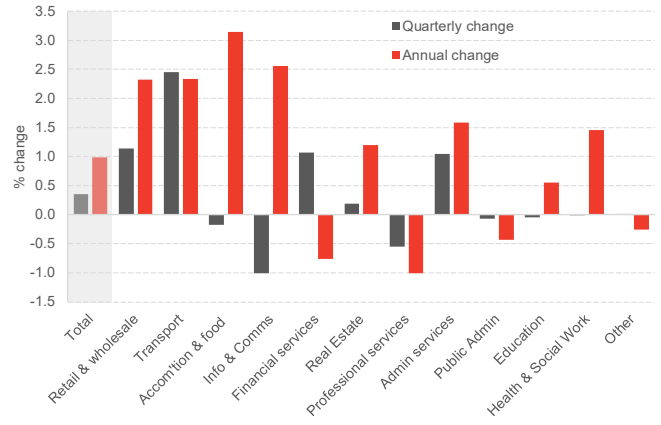
	% of Economy	Growth 2017	Growth Q2 2018	Key issues/trends
Production	**17%**	**1.9%**	**0.6%**	
Manufacturing	11%	1.7%	0.9%	■ Confidence and growth has returned recently – boosted by a more positive outlook for the oil and gas supply chain ■ Exporters likely to continue to benefit from weak pound and strong global economy. But also most likely to be at risk from dislocation of UK-EU trade
Food and drink	3%	-0.7%	4.0%	■ Sector continues to grow strongly – and is now at its highest ever level ■ Growth potential is high, although boosting productivity in sector will be key for sustainability ■ Future post-Brexit challenges could include 'just-in-time' deliveries and access to migrant workers
Services	**76%**	**0.9%**	**0.4%**	
Retail and wholesale	10%	1.4%	1.1%	■ Aggregate data suggests a recent upturn in sector activity ■ Micro data suggests tough trading conditions, with many high-profile names on the high street struggling ■ Rising wages could give some respite to a sector going through significant structural change
Accommodation & food services	3%	0.3%	-0.2%	■ Mixed performance with growth over the year, but some fall-back in the most recent quarter ■ Like retail, many casual eating and drinking establishments have been struggling. Changes in how households consume entertainment is impacting many business models ■ Tourist faring elements of the sector continue to improve
Financial & insurance	6%	-1.3%	1.1%	■ Relative modest output in this key sector of the Scottish economy ■ Unlike other sectors directly exposed to the financial crisis – such as professional services and real estate – financial services has taken much longer to get back on its feet ■ Uncertain future for financial services in relation to trading with Europe, even under the 'Chequers' plan
Construction	**6%**	**4.3%**	**1.8%**	■ Significant revisions to official data paint a more positive picture for sector than before ■ Uplift in public sector capital investment should help support infrastructure, but wider measures of activity – including commercial property and house-building – remain relatively subdued
Agriculture	**1%**	**4.5%**	**-1.2%**	■ Sector grew in 2017 but is arguably most exposed to any hit to migration post-Brexit ■ Sector will need clarity on support, opportunities and regulation post-Brexit to ensure growth can continue

Chart 22: Manufacturing and Food & Drink in Scotland, Q1 2013 — Q2 2018



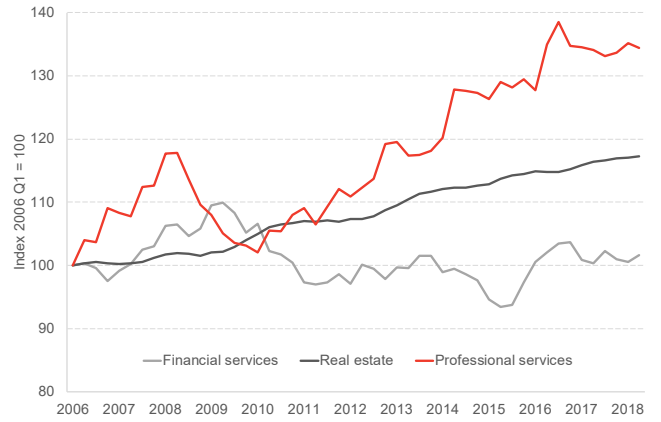
Source: *Scottish Government & FAI calculations*

Chart 23: Growth in services over quarter and year



Source: *Scottish Government & FAI calculations*

Chart 24: Financial services in Scotland since the crisis



Source: *Scottish Government & FAI calculations*

But there is also increasing evidence of a wider recovery. For example, manufacturing grew by 0.9% over the quarter and by 3.2% over the year on 4Q-on-4Q basis.

A key driver of this has been the strong growth in Scotland's food and drink sector. The sector has grown 3.0% over the year on a 4Q-on-4Q basis to reach its highest ever level. (Chart 22)

Whilst electricity and gas supply activity has slipped back a little in the most recent quarter, growth was strong over the year buoyed by renewables output.

Within services, growth has been more modest but – for the most part – broadly positive. (Chart 23)

Retail and accommodation and food sectors have picked-up. Whilst positive, it is clear from wider indicators that such sectors continue to find trading conditions challenging.

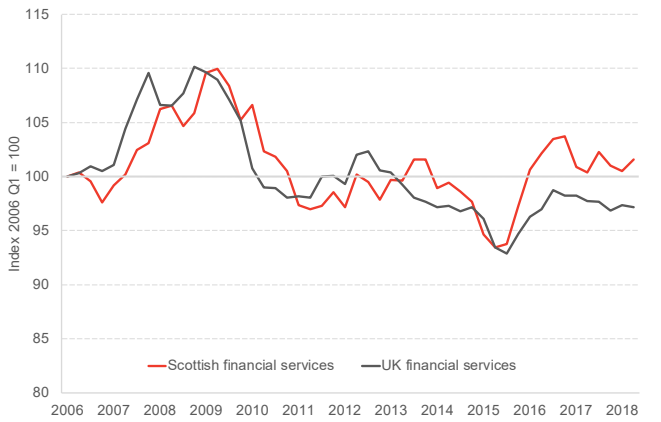
If the rise in earnings continues to build momentum, then this should provide some respite. However, many of the challenges that they face are more structural and relate to the way in which people now choose to consume such services (e.g. online retailing).

One sector which returned to growth was financial services, which grew by 1.1% in Q2.

But as Chart 24 highlights, the sector continues to lag behind its counterparts, such as real estate and professional services. (Chart 24)

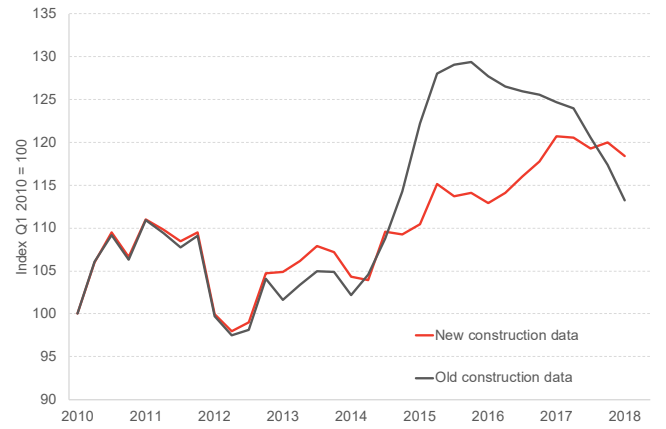
That said, Scotland's financial services industry appears to be no different in operating on a slightly smaller scale – post financial crisis – than the UK sector. (Chart 25)

Chart 25: Financial services in Scotland since the crisis



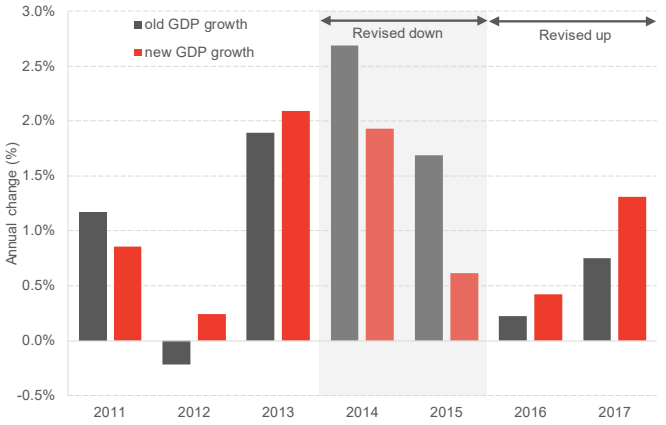
Source: *Scottish Government, ONS & FAI calculations*

Chart 26: Revisions to construction GDP, Q1 2010 = 100, Q1 2010 — Q2 2018



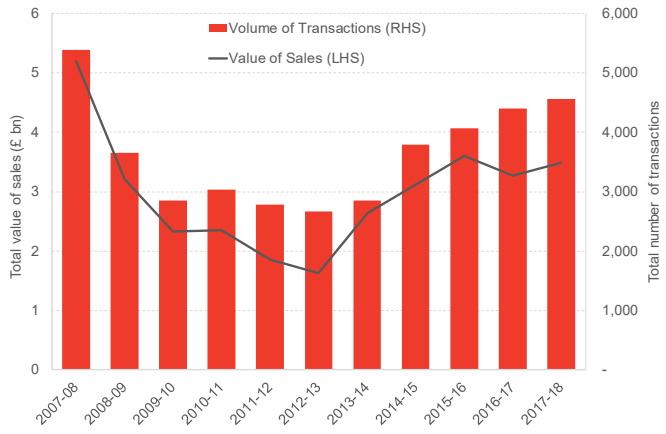
Source: *Scottish Government & FAI calculations*

Chart 27: Revisions to GDP growth, %, 2011 – 2017



Source: *Scottish Government & FAI calculations*

Chart 28: Commercial property transactions in Scotland, 2007-08 to 2017-18



Source: *National Registers of Scotland*

Revisions to Scottish construction data

Back in June, we discussed the puzzling patterns in the Scottish construction series.

The official Scottish Government data had been showing a sharp rise in construction activity during 2014 and 2015 – by around 30% - before falling back in 2017 and 2018.

The scale of such changes was unprecedented.

The government had hypothesised that the figures were driven – in part – by a number of major infrastructure projects coming to an end (such as the Queensferry Crossing and M8 upgrade).

But even with expanded borrowing powers, and growing capital budgets, this was always difficult to reconcile with activity on the ground and what other data was telling us.

In August, the statistics were revised substantially (Chart 26). The official data now show construction growing since 2014, with only a modest decline in recent times.

As a result, even though construction accounts for just 6% of our economy, the revisions were of such a large scale that they changed the entire profile of growth in the Scottish economy. (Chart 27)

In June, the Scottish Government published growth estimates for 2017 of just 0.8%. Now that figure is 1.3%.

That being said, the changes do not alter Scotland's long-term growth profile (with GDP per head still rising by just under 2% over the decade).

Revisions are an important and necessary part of producing robust economic statistics. And there are advantages in making major changes to methodology at set points in time.

These data have wider implications with sustained weak economic performance unlocking emergency borrowing, depending on the performance of the economy.

So one lesson is perhaps the need to revise more quickly if the official methodology is clearly and *significantly* inconsistent with wider evidence.

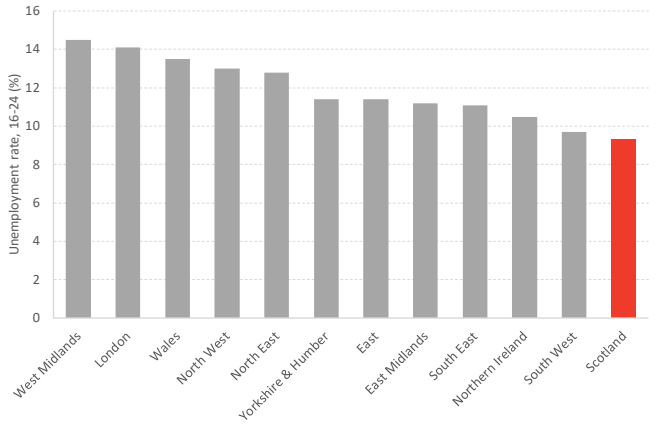
Double checking a suite of data, e.g. commercial transactions, actual Scottish Government data on infrastructure spending, housing completions etc, should provide a more accurate picture. (Chart 28)

Table 3: Scotland and UK labour market, May - Jul 2018

	Employment rate (16-64)	Unemployment rate (16+)	Inactivity rate (16-64)
Scotland	75.1%	4.1%	21.7%
Quarterly change (pp)	*-0.1*	*-0.2*	*0.3*
Annual change (pp)	*-0.8*	*0.3*	*0.5*
UK	75.5%	4.0%	21.2%
Quarterly change (pp)	*-0.1*	*-0.2*	*0.3*
Annual change (pp)	*0.2*	*-0.3*	*0.0*

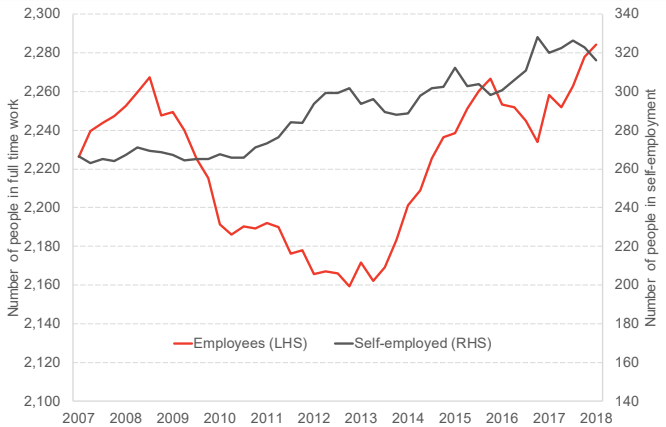
Source: *ONS, LFS*

Chart 29: 16-24 unemployment rate, Apr 2017 - Mar 2018



Source: *ONS, APS*

Chart 30: Number of employees and self-employed in Scotland since 2007



Source: *ONS, LFS*

Scottish labour market

Unemployment in Scotland remains low and, taking the confidence intervals around headline estimates into account, effectively no different from the UK.

But over the last year, there has been a degree of weakening in labour market outcomes. Employment has fallen by around 40,000, whilst there has been a rise 7,000 in unemployment. (Table 3)

One big success story for the labour market in Scotland in recent years has been substantial drops in youth (16-24) unemployment. Scotland currently has the lowest 16-24 unemployment rate of anywhere in the UK. (Chart 29)

One feature we have discussed in past commentaries, has been the rise in part-time work and self-employment, with a corresponding relative squeeze on the number of full-time employees.

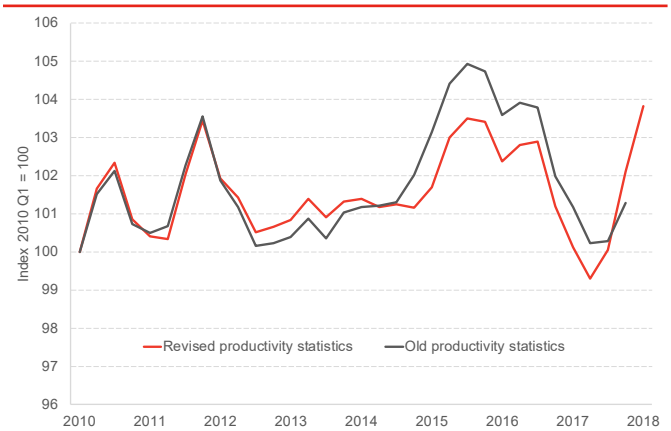
Interestingly, over the last year to 18 months this trend has eased. Instead, the number of employees has been on the rise, as has the number of full-time workers. (Chart 30)

The fall in employment, alongside the revisions to GDP growth by the Scottish Government, has led to a bounce back in Scotland's productivity numbers. Labour productivity in Scotland is nearly 4% higher than this time last year.

However, these revisions do little to alter Scotland's relatively weak track record in productivity – with last year's boost counterbalanced by weaker than before estimates for productivity in earlier years. (Chart 31)

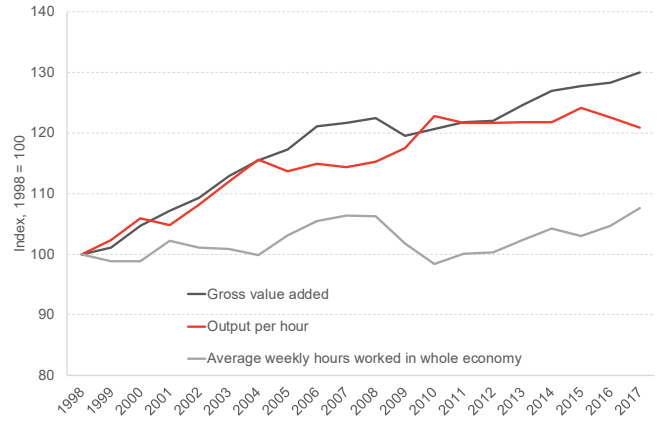
As a result, productivity in Scotland is largely back at 2011 levels.

Chart 31: Revised productivity estimates, Q1 2010 — Q1 2018



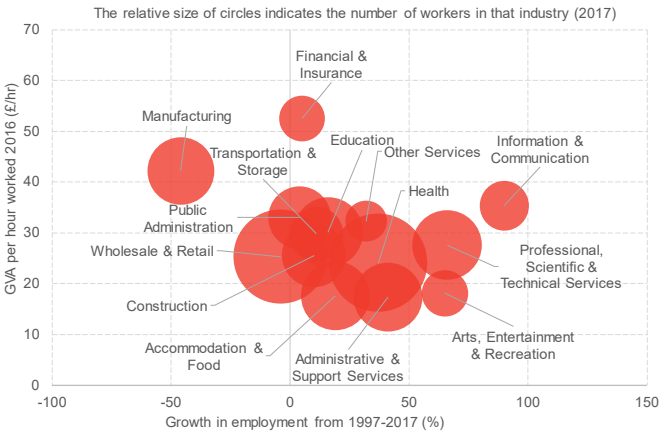
Source: *Scottish Government*

Chart 32: Components of Scottish Productivity, 1998 — 2017



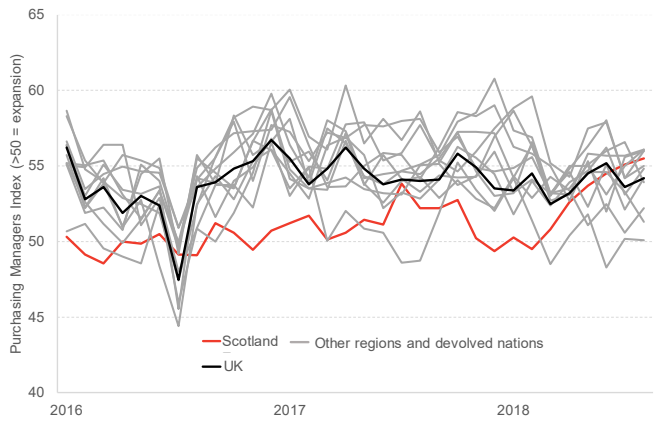
Source: *Scottish Government*

Chart 33: Growth in employment from 1997-2017 and GVA per hour worked in 2016, size of circle indicates the number of workers in that sector



Source: *ONS & FAI analysis*

Chart 34: Royal Bank of Scotland PMI, Jan 2016 — Aug 2018



Source: *Royal Bank of Scotland & IHS Markit*

Over a longer time horizon, productivity has lagged behind wider growth in the economy. The slack has been picked up by rising employment. (Chart 32)

But with an ageing population, employment at near record levels, and uncertainty over the future of migration post-Brexit, it is not difficult to see why turning around Scotland's productivity performance is so crucial to future prosperity.

Greater efficiency, not just in high value added sectors, but across our economy will be key. (Chart 33)

Latest Scottish indicators

Over the summer, indicators of day-to-day activity in the Scottish economy have held up relatively well.

This backs up the assessment we made in June that, despite Brexit uncertainty, underlying economic conditions have strengthened a little. We retain that cautious optimism.

Some of this is undoubtedly tied to a more positive outlook for oil and gas. But there are also signs that activity has been stabilising or picking-up across the wider economy.

For example, at 55.5, the RBS Purchasing Managers Index (where ›50 marks expansion; ‹50 marks contraction) is the strongest it has been in four years. Indeed last month's figure was the first time since July 2016 that Scotland outpaced the UK average. (Chart 34)

A similar rise in activity was found in the latest Quarterly Economic Indicator from the Scottish Chamber of Commerce.

All sectors were showing positive trading conditions and optimism in Q2 2018, with tourism once again leading the way. (Chart 35)

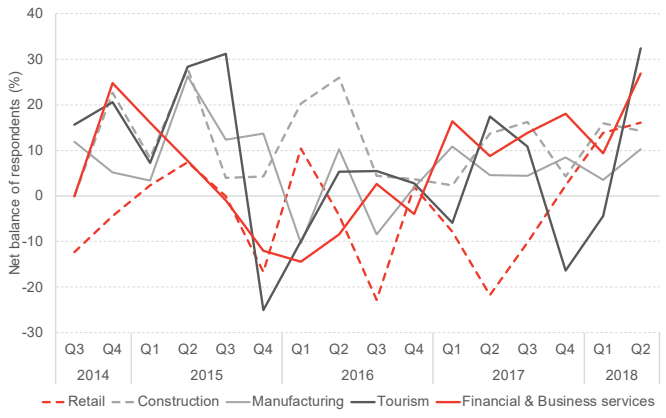
Our own Scottish Business Monitor – produced in association with RBS – highlights a similar picture.

The latest results for new and repeat business continue to grow. (Chart 36)

Optimism is also on the rise.

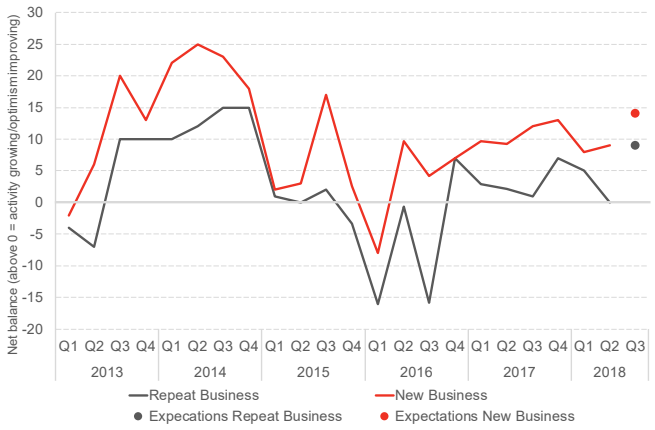
One exception to this was the latest Federation of Small Businesses Scotland confidence index which fell from plus 5.1 points to minus 13.2 points with Scottish businesses amongst the most concerned in the UK about a no-deal Brexit.

Chart 35: Quarterly Economic Indicator: business optimism, Q3 2014 — Q2 2018



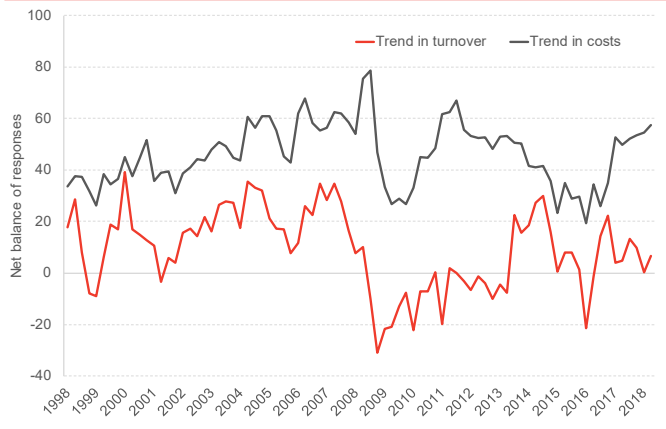
Source: *FAI & Scottish Chambers of Commerce*

Chart 36: Scottish Business Monitor: repeat and new business, Q1 2013 – Expected Q3 2018



Source: *FAI-RBS Scottish Business Monitor*

Chart 37: Scottish Business Monitor: turnover and costs, Q1 1998 — Q2 2018



Source: *FAI-RBS Scottish Business Monitor*

One advantage of our Business Monitor is the ability to track trends in activity over time. The survey has been running on a consistent basis since 1998. It therefore provides a valuable record of conditions in the Scottish economy.

Over time, we find that – on balance – most firms tend to report costs rising ahead of turnover. Clearly this cannot happen forever, and shows an inherent nervousness built into most firms' interpretation of current conditions (i.e. they tend to be more worried about costs rather than opportunities). (Chart 37)

What is revealing however, is where the gap widens and narrows and how closely this tracks Scotland's growth record. When the gap grows - e.g. 2008/09 and 2015/16 – growth slows. When the gap narrows, growth tends to pick-up.

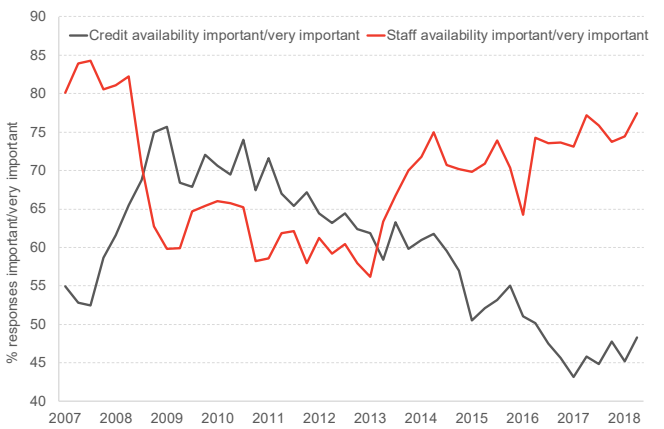
Another advantage of our Business Monitor, is the ability to track 'hot topics' over time.

Access to finance and access to workers is just one element. We find a sustained fall in the number of firms citing credit availability as an important issue for them (but rise in concerns over staff availability). (Chart 38)

One interpretation of these data is that the current period of heightened uncertainty is leading businesses to meet any increase in demand by taking on more workers, rather than investing in new plant and machinery.

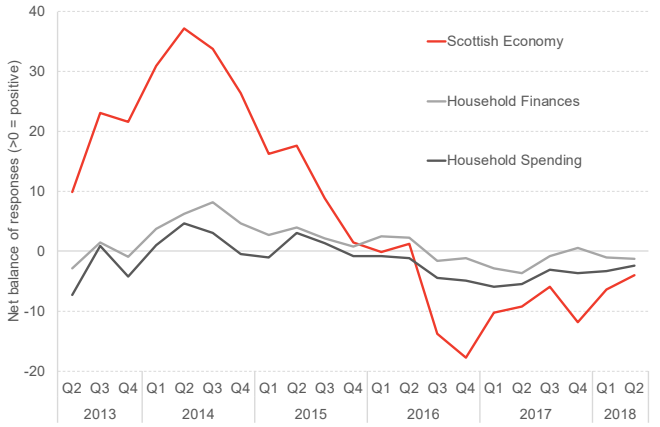
These data pose questions for recent efforts – such as the new Scottish National Investment Bank and British Business Bank – to boost the supply of finance. Our survey suggests that demand for credit is likely to be just as important.

Chart 38: Scottish Business Monitor: credit and staff availability important/very important, Q1 1998 — Q2 2018



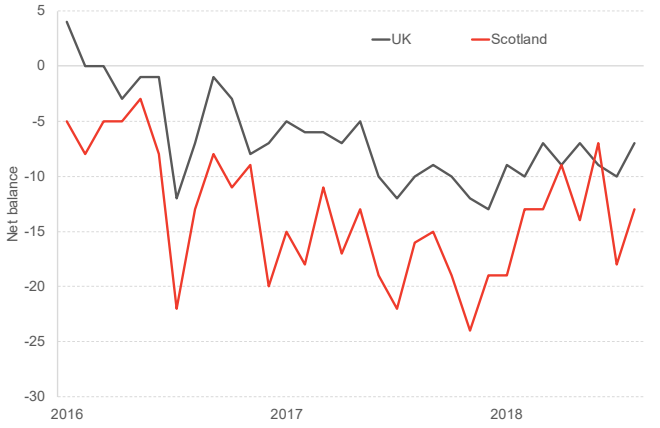
Source: *FAI-RBS Scottish Business Monitor*

Chart 39: Consumer Sentiment Index current conditions: the economy, household finances and spending, Q2 2013 — Q2 2018



Source: *Scottish Government*

Chart 40: Consumer confidence in Scotland and the UK, Jan 2016 – Aug 2018



Source: *GfK*

One area of ongoing fragility is around consumer and household confidence.

Scottish households' assessment of current conditions remains weak – although they have at least stabilised in recent times. (Chart 39 and 40).

For comparisons the GfK indicator for August 2018 was -13.

It would appear that the key driver of the slightly more pessimistic outlook is households' expectations for the economy.

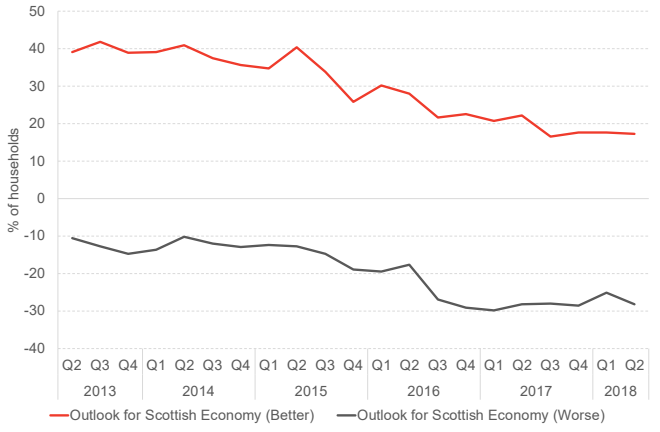
In contrast to their expectations for their own finances (which remain positive), an increasing number believe that the outlook for the economy is negative. (Chart 41)

The outlook for the labour market however, remains positive. (Chart 42)

The latest Royal Bank of Scotland Report on Jobs shows its headline indicator for labour market activity remains above its 12 month rolling average.

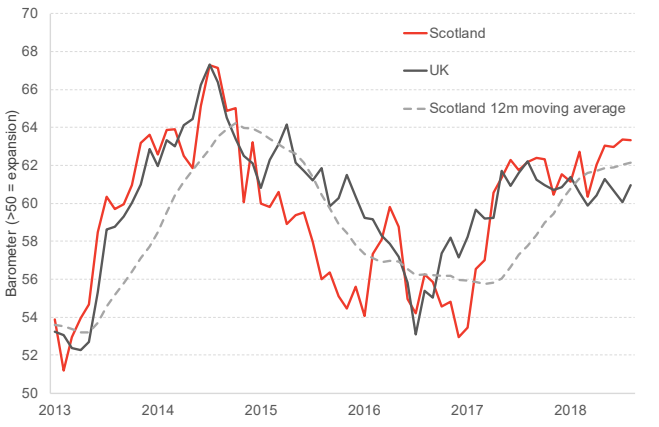
This should help – in time – put upward pressure on real wages, bolstering household incomes.

Chart 41: Consumer Sentiment Index expectations: Scottish economy, Q2 2013 — Q2 2018



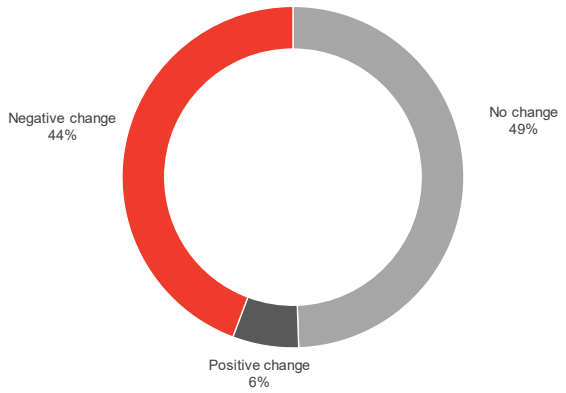
Source: *Scottish Government*

Chart 42: Jobs market indicator, Jan 2013 — Aug 2018



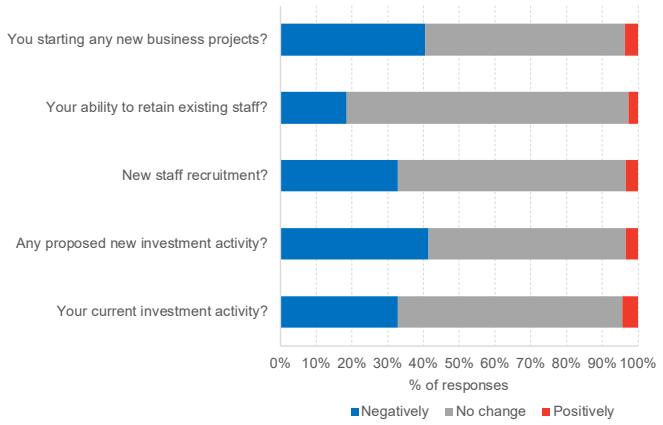
Source: *RBS & IHS Markit*

Chart 43: What has been the impact of the Brexit decision, to date, on your business?



Source: *Fraser of Allander Institute*

Chart 44: How has the Brexit decision affected...



Source: *Fraser of Allander Institute*

Chart 45: Do you feel that your business is prepared for Brexit?

Source: *Fraser of Allander Institute*

Focus: FAI Brexit survey

In July, we undertook a survey of Scottish firms to assess their preparedness for Brexit. Over the course of the month we spoke to around 350 businesses from across the country and from a variety of different sectors.

The focus of the survey was not on whether or not businesses believe Brexit to be good or bad, but instead, how their preparatory plans were taking shape.

Around half of the businesses we spoke to said that the decision so far had no impact on their business activity. Only 6% said it had been positive, with 44% saying the impact had been negative. (Chart 43)

33% of firms said that it has had a negative impact on current investment activity (4% positive), with 41% saying that it has had a negative impact on new investment (3% positive).

33% indicated that it has had a negative impact on staff recruitment (3% positive). (Chart 44)

Brexit is happening, like-it-or-not. So it is vital that businesses prepare for such an eventuality. We asked firms about their preparedness for Brexit.

Only 38% said that they believed that they were prepared for Brexit. (Chart 45)

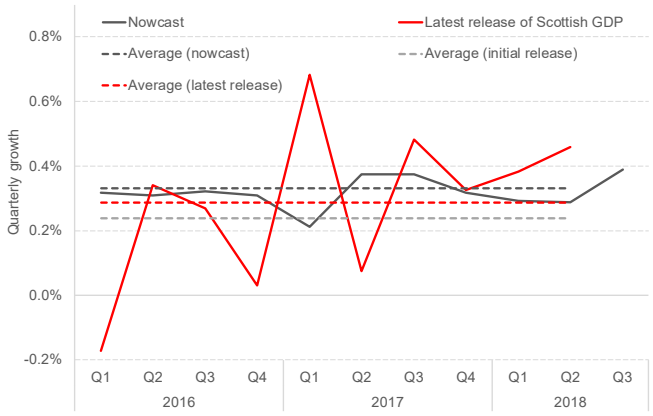
We also asked about the level of information that is available to them to make such preparations.

The overwhelming response was that there is not enough information currently available to enable them to plan for potential Brexit outcomes.

'Uncertainty over the UK Government's objectives in the negotiations' was the most popular response amongst businesses (with over 59% citing this as a factor).

Finally, in terms of possible opportunities. Whilst 51% of business surveyed indicated that they did not see any immediate benefits, 28% of those surveyed believed that there might be benefits from moving away from EU regulations with 26% pointing to possible increased funding from the Scottish and/or UK Government in the future. Only 18% thought of opportunities in new markets outside the EU.

Chart 46: FAI nowcast and the latest release of Scottish GDP estimates, Q1 2016 – Q3 2018



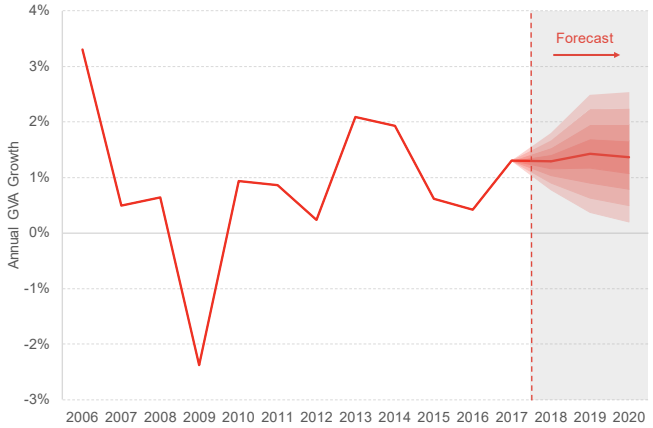
Source: *Fraser of Allander Institute*

Table 4: Nowcasts for Scotland's GDP in Q2 and Q3 2018

	Q2	Q3
Quarterly Growth	0.33%	0.39%
Annualised Growth	1.34%	1.57%

Source: *Fraser of Allander Institute*

Chart 47: FAI forecast Scottish economic growth range



Source: *Fraser of Allander Institute*

* Actual data to 2017. Central forecast with forecast uncertainty for 2018 – 2020. Uncertainty bands sourced from accuracy of past forecasts at different forecast horizons.

Our forecasts

Chart 46 shows our latest nowcasts and also how they have tracked against the official data both before and after the recent revisions to the GDP series.

Our nowcasts do a much better job of tracking the revised estimates of GDP compared to the first estimates.

Last week's data, confirmed that growth continued into the 2nd quarter of 2018 picking up over the first three months.

As we have discussed before, quarterly results for Scotland can be relatively volatile given the size of the economy.

The latest results are therefore broadly consistent with our expectations for growth in 2018 that we first made back in 2017.

On balance, we believe that – setting aside any risks from the Brexit negotiations going awry – Scotland should be on track to grow at a broadly similar rate to last year (if not slightly faster). (Table 4)

Turning to our forecasts for the next three years, as in the past, we report a central forecast but also uncertainty bands that set out a likely range within which we predict Scottish economic growth will lie.

It is important to note that such bands are based upon historical variations in our 'normal' forecasting performance. Looking ahead, the potential for a 'no-deal' Brexit outcome is clearly not a 'normal' event. Should this occur, an entirely new set of forecasts will be required. But with so much uncertainty over what this could mean – politically and economically – we have not published such an estimate at this stage. An update will be provided in December.

Overall, our base forecasts are very similar to June. (Table 4 and Chart 47)

Table 5: FAI forecast Scottish GDP growth (%) 2018 to 2020

	2018	2019	2020
GDP	**1.3%**	**1.4%**	**1.4%**
Production	1.5%	1.6%	1.5%
Construction	1.0%	1.1%	1.0%
Services	1.2%	1.4%	1.3%

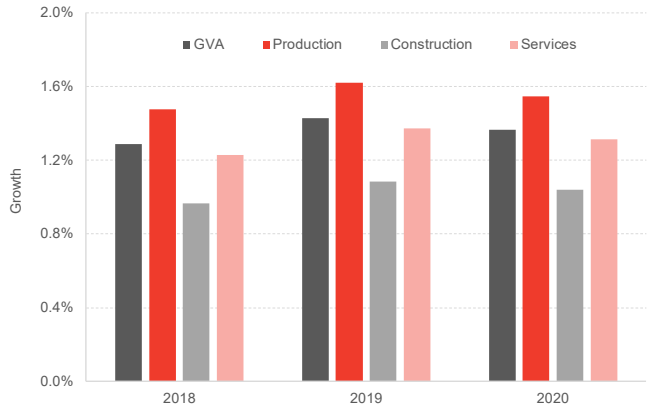
Source: *Fraser of Allander Institute*

Table 6: Latest growth forecasts for the UK economy

	2018	2019	2020
Bank of England	1.5	1.8	1.7
OBR	1.5	1.3	1.3
NIESR	1.4	1.7	1.7
European Commission	1.5	1.2	-
IMF	1.4	1.5	-
Oxford Economics	1.3	1.4	2.0
ITEM Club	1.3	1.5	1.7
CBI	1.5	1.3	-

Source: *HM Treasury, Bank of England, OBR*

Chart 48: FAI GDP forecasts by sector, 2018 – 2020



Source: *Fraser of Allander Institute*

Table 7: FAI Labour Market forecasts to 2020

	2018	2019	2020
Employee jobs	**2,495,250**	**2,521,950**	**2,547,550**
% employee job growth over year	1.0%	1.0%	1.0%
ILO unemployment	111,400	114,150	118,900
Rate (%)[1]	4.2%	4.2%	4.3%

Source: *Fraser of Allander Institute*

Absolute numbers are rounded to the nearest 50.

[1] Rate calculated as total ILO unemployment divided by total of economically active population aged 16 and over.

Our central forecast is for growth of 1.3% in 2018 followed by growth of 1.4% in 2019 and 2020.

In short, we believe that the Scottish economy will grow this year, will quicken slightly over the forecast horizon, but growth will remain below trend.

Our latest forecasts for Scotland put us slightly behind the Bank of England's forecast for the UK economy but ahead of the OBR's UK forecast. (Table 5). Whilst we do not forecast the UK economy directly, on balance, we believe that Scotland will do well to match UK growth over the next few years.

A no-deal outcome would significantly lower our forecasts as businesses adjust to this new normal.

With nominal earnings growth expected to continue to pick-up, and provided that this outpaces inflation, household spending should see some modest gains.

Investment activity is likely to remain under pressure as Brexit-uncertainty continues to cast a shadow over growth ambitions. This element of our forecast carries the greatest risk and has the greatest potential to be negatively hit should a 'no-deal' outcome become a reality.

Net exports and tourism are on track to continue to benefit from the low value of Sterling.

As in recent years, services should make the greatest contribution to overall growth. However, we also expect the outlook for manufacturing to continue to be more positive, particularly as optimism in the North Sea supply chain continues to improve.

Building on recent growth, professional and business services are placed to do better. And with major new public investment in the pipeline, the construction sector should continue to see a more sustained outlook.

We expect unemployment to rise slightly toward a level consistent with more medium-term trends. So any reported rise in unemployment in the coming months should pose little concern. (Table 6)

Policy context

Tackling regional economic inequalities

Tackling regional economic disparities has been a priority of successive governments in both the UK and Scotland.

The UK Government's Industrial Strategy is their latest attempt, with regional growth 1 of 5 'foundations of success'. Here in Scotland, 'cohesion' – or its new term 'regional inclusive growth' – has been a feature of the Scottish Government's Economic Strategy since 2007.

It is hard to disagree that a country will be economically stronger if every region has the opportunity to fulfil its potential.

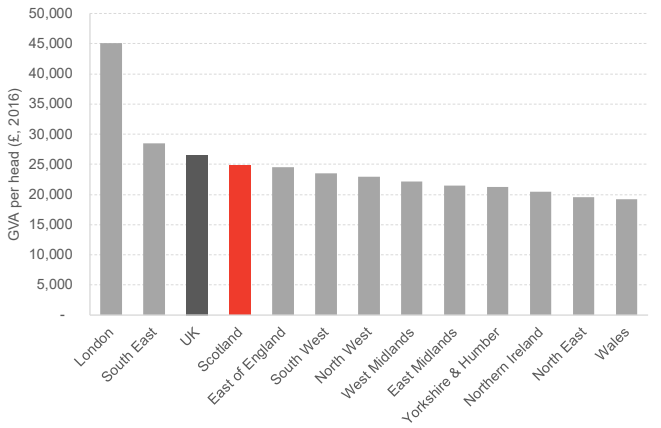
However, Scottish and UK policy history is littered with well-intentioned – but ultimately ill-fated – attempts to narrow the gap in economic performance between regions. Many of the challenges are deep-rooted and structural, whilst attempts to tackle them throw-up challenging trade-offs and political risks.

Regional inequalities in Scotland and the UK

Much has been written about the unbalanced nature of the UK economy.

Scotland performs relatively well despite that context. Our onshore GDP per head was just below £25k in 2016 - 3rd behind London and the South East.

Chart 49: GVA per head across the UK (2016)

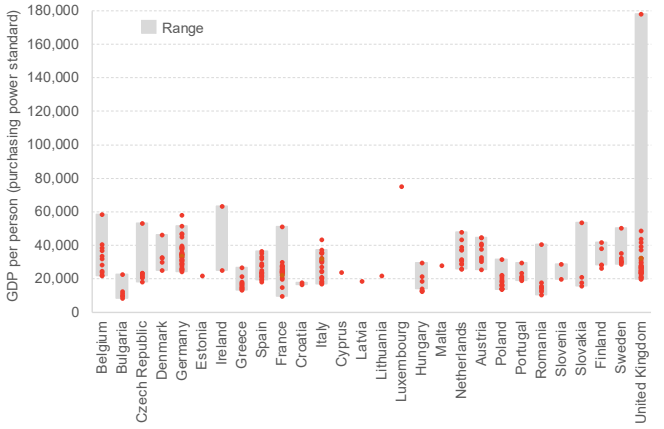


Source: *ONS*

What is stark is the variation in economic performance by UK region. GVA per head in London is over 70% higher than the UK average. (Chart 49)

Looking at the more disaggregated data the disparity is even greater. It is clear that the UK, or more specifically one part of London, stands as an outlier in Europe. (Chart 50)

Chart 50: GVA per head, difference between richest and poorest parts of EU countries (NUTS2 regions, 2016)

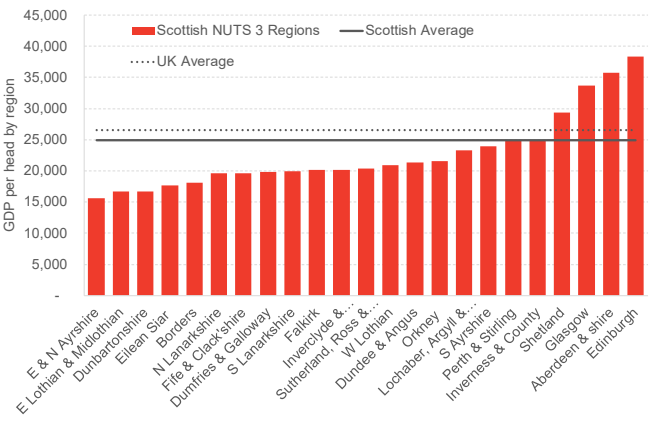


Source: *Eurostat & FAI Calculations*

One might expect the dominance of London to have waned following the financial crisis. If anything it has increased, widening UK interregional disparities.

But before we think that this is just a London or UK phenomenon, the same data also reveals the scale of regional inequality in Scotland. (Chart 51)

Chart 51: GVA per head Scotland's NUTS 2 regions (2016)



Source: *ONS*

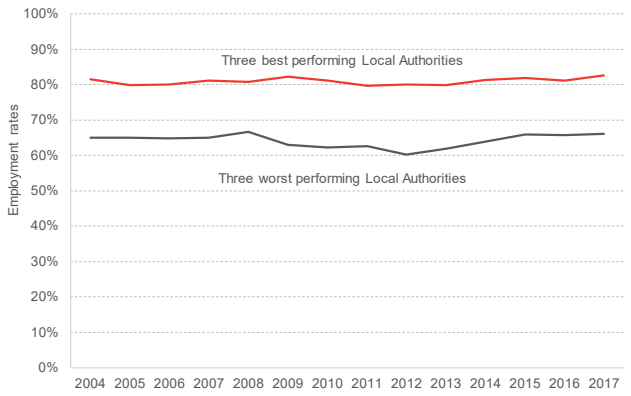
GVA per head in Edinburgh is nearly 2.5 times higher than in East and North Ayrshire. And over time, the gap has widened. GVA per head in the capital has nearly doubled since devolution, with growth in East and North Ayrshire around half that rate.

This translates into widening economic and social outcomes across Scotland. In North Ayrshire for example, around a third of children are in households classified as being in relative poverty.

And back in 2007, the Scottish Government established a target to narrow the gap in employment between the three 'best' performing and the three 'worst' performing local authorities in Scotland.

As the chart below highlights, a decade later, the gap remains largely the same. (Chart 52)

Chart 52: Difference in employment rate for the three best and worst performing Local Authorities (2004 – 2017)



Source: *Scottish Government*

The Centre for Regional Inclusive Growth

This summer the Scottish Government launched its Centre for Regional Inclusive Growth.

So far this is a website. It pulls together local information and statistics. But the Centre does not (yet) offer any fresh insights into how to tackle the questions that have underpinned this policy area for decades.

Indeed, on policy solutions, evaluation of current programmes or plans for new investment, it is silent.

The website points to Regional Partnerships which are to come forward with new ideas but there is little detail on what resource will be made available and how 'asks' to central government will be acted upon.

Perhaps we will see more in the upcoming Budget.

Policy opportunities and challenges with Regional Inclusive Growth

So one cannot help follow recent UK and Scottish Government initiatives and ask the question – "so what happens next?" It is hard not to be sceptical over any hope that current initiatives will tackle the wide and deep-rooted variations in economic performance across Scotland.

Narrowing regional inequalities is not easy. The challenges are complex and – often – deep-rooted.

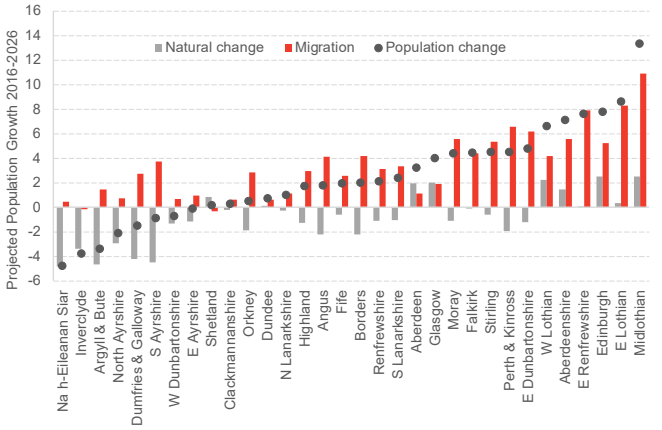
Firstly, there are a great many structural factors why some parts of the country lag behind.

For example, the industrial mix of regions varies significantly. Many of the challenges that parts of west central Scotland face can be traced to the rapid de-industrialisation of the 1970s and 1980s and a reliance on relatively low value service industries.

Social deprivation and health barriers often act as self-reinforcing barriers to economic prosperity. Geography also plays a part, with much of Scotland subject to the challenges of rurality and remoteness. Parts of our cities struggle with poor housing stock and wider basic infrastructure.

The make-up of a region's population can also act as a significant drag on long-term growth. Some of the most fragile parts of the country are on track to lose population over the next few years. (Chart 53)

Chart 53: Projected population growth in Local Authorities in Scotland, 2016-2026



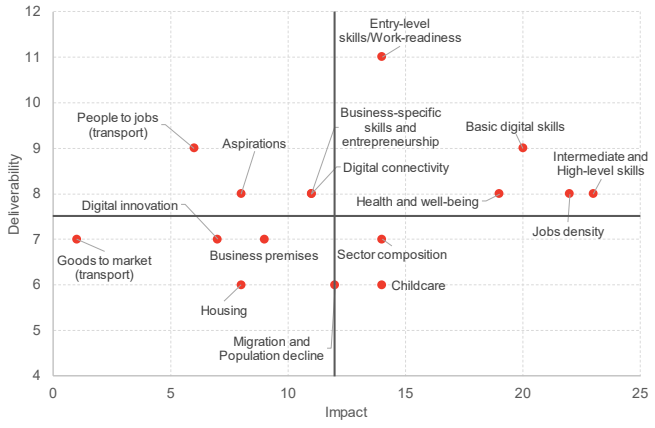
Source: *National Records Scotland*

Secondly, local areas often lack the tools to turnaround their economic performance (beyond limited interventions at the margins). Many of the levers that will make a difference – jobs, health and well-being, population, digital and transport connectivity – are national responsibilities.

Indeed, a quick glance at the diagnostic results from the Centre's pilot study for North Ayrshire poses the question, "what realistic levers do local policymakers have to effect change in these areas?" (Chart 54)

At the same time, local government budgets have been squeezed putting pressure on local government jobs and wages. As local authorities prioritise statutory responsibilities, it is no surprise that many have scaled back support for economic development.

Chart 54: Prioritisation matrix for North Ayrshire



Source: *Scotland's Centre for Regional Inclusive Growth*

Interestingly, the mechanism for funding local authorities has not changed much over time, and certainly not since regional inclusive growth has risen up the policy agenda. Perhaps that needs to change?

Thirdly, there is often a basic tension at the heart of national economic policy over where resources are targeted, particularly in a world of tight public spending.

On the one hand, prioritising policy efforts at areas of economic strength – like the strong parts of our cities – can create spill-overs, promote international competitiveness and lead to national benefits. But on the other hand, it is arguably only by shifting resources to areas in economic need that can one realistically expect gaps to be narrowed.

We have seen this played out in recent months, most visibly in the case of North Ayrshire.

The decision to locate the new Medicines Manufacturing Innovation Centre (MMIC) close to Glasgow Airport might make sense from an agglomeration and connectivity perspective. From an inclusive growth perspective, it passed up an opportunity to support private sector activity and the creation of skilled jobs - as part of an Ayrshire Growth Deal – in an area of the country where such investment is rarely undertaken and much needed.

The decision to locate the new Social Security Agency in Dundee was another such example. On this occasion, despite North Ayrshire being clearly identified as scoring best for 'inclusive growth' it was passed over by national policy makers because it was felt that the local authority might struggle to attract people to work there (despite transport links improving).

Anyone can agree or disagree with such a decision, and few would argue with the importance of ensuring that the new Social Security Agency performs effectively from day one. But it arguably highlights that even the Scottish Government itself – the key advocate of regional inclusive growth – often finds it difficult to back-up its vision with investment and funding support.

Finally, and an issue we have raised in previous commentaries, is that in attempting to be 'all-things-to-all-people', the policy landscape can become complex and cluttered.

Currently, we have a patchwork of 32 local authorities, various City-Region Deals, a new suite of Regional Partnerships, not to mention the large number of strategies and programmes many of which have their own regional dimension (including 32 Single Outcome Agreements).

Coordinating such activity across boundaries, different tiers of government (and governance) – often of different political hues – inevitably makes for a complex delivery landscape.

Summary

Delivering regional inclusive growth is not easy.

Regional disparities reflect decades of social and economic change, as well as the basic geography of Scotland.

The Scottish Government should be commended for pushing it up the policy agenda.

Ultimately, however, tackling regional inequalities will only be achieved by investing significantly in Scotland's more fragile economic communities, finding out what works (and what does not) and prioritising some areas of the country over others whatever the impact on wider economic and political objectives.

Otherwise, we run the risk of continuing to talk about these issues while regional inequalities continue to widen.

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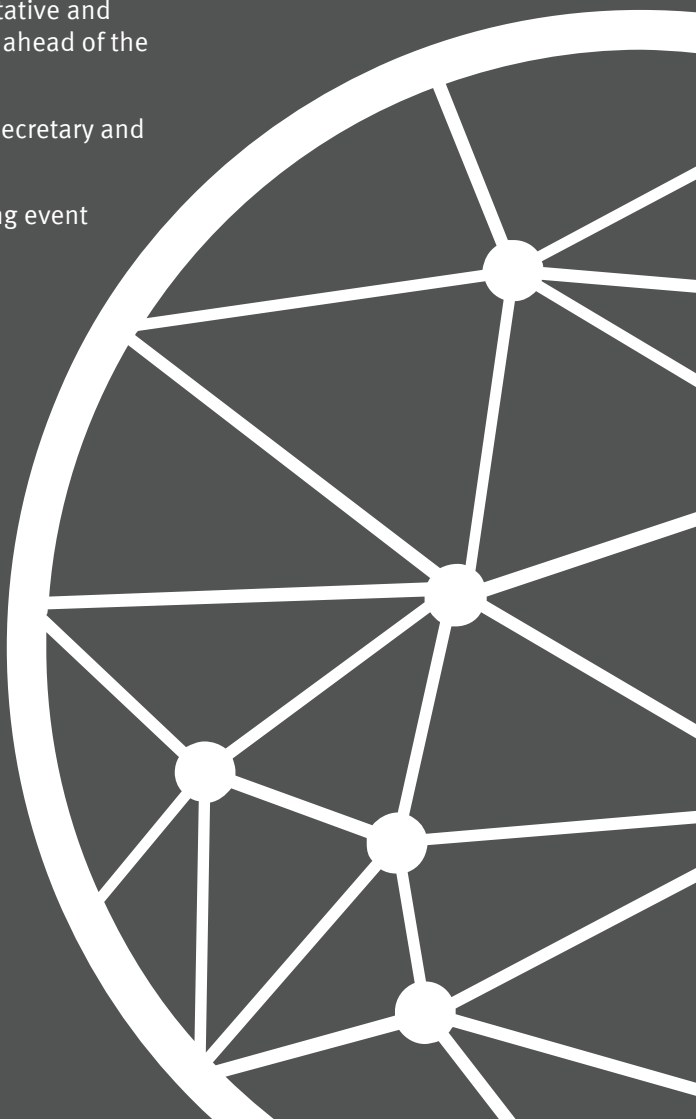

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Reappraising Scotland's exports and their geographies: Brexit and beyond

Ronald V. Kalafsky, University of Tennessee and Ross Brown, University of St Andrews

Abstract

Firms internationalise to expand and diversify their sales, while policymakers see exports as a means of promoting productivity and economic growth. Exports therefore receive an increasing amount of attention given these positive attributes. Within this context, this paper presents data on the geographies and dynamics of Scotland's export patterns. It shows that Scottish exports are highly concentrated within a small number of global markets, with Scottish firms exhibiting a decreasing reliance on exports to the European Union. Only a small minority of Scottish SMEs export and the majority of these firms derive less than a quarter of their sales from international markets. These lines of enquiry are presented within the context of the impending departure of the UK from the European Union and what this might mean for Scotland's exporters. The paper ends with some indicative policy recommendations.

I Introduction

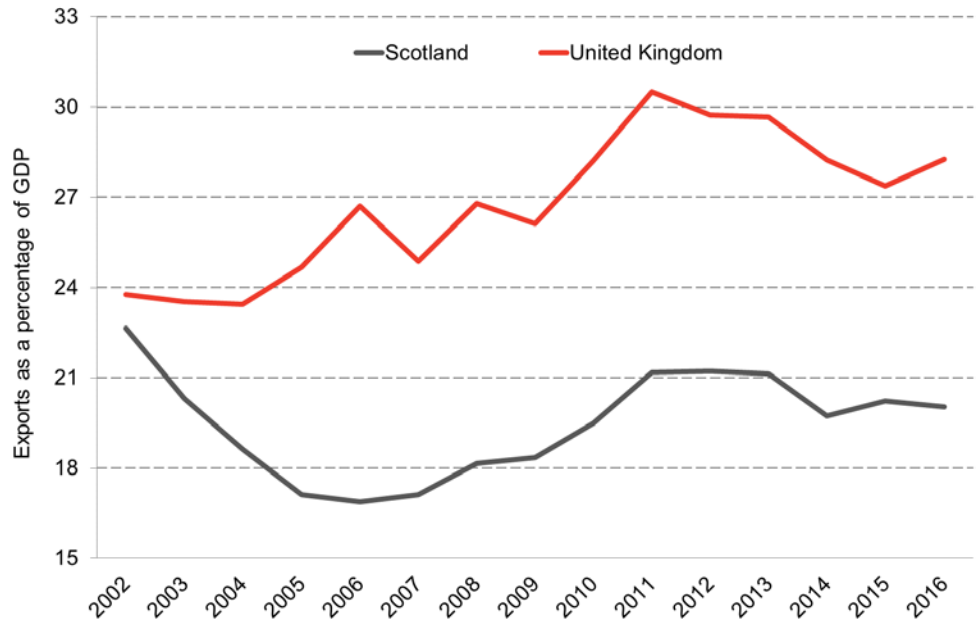
Policymakers understandably direct a fair amount of attention to exporting, given its potential for jobs, innovation and economic growth (Wright et al, 2007; Love and Roper, 2015). Underscoring this interest, a seminal paper on firm-level exporting motivations suggests that the policy-led support for exports, regardless of location, stems from the understanding that, "exports are good, and exporters are good firms; thus helping domestic firms export is good policy" (Bernard and Jensen, 2004, p. 561). Understandably therefore, trade policy has often been at the centrepiece of industrial policies within modern economies (Rodrik et al, 2004).

Accordingly, a healthy amount of attention is paid to exporters and their dynamics at various scales. From a firm-level perspective, exporting offers the potential to expand beyond domestic or regional markets – markets that, in some cases, which may be in decline or offer diminished growth prospects. From a national perspective, exporting offers countries the ability to enhance their growth prospects. That said, the relationship between exporting and economic growth are

far from unequivocal (Mookerjee, 2006). The effects of exporting are often dependent on the national *milieu* in which trade takes place and includes the composition of exports in terms of individual products and services and even the destinations to which exports are sent. Clearly, the topic merits more attention and study.

This topic is particularly salient to Scotland, as a small, open economy with a limited domestic market. Accordingly, recent policy papers have examined the export dynamics of Scotland, finding that exports are critically important especially for some key sectors (Slow et al, 2015; Hamilton and Richmond, 2017). What these studies also suggest is that Scotland often lags much of the rest of the United Kingdom in key measures such as the number of firms engaging in exporting. This is reflected by fact that just 70 firms account for some 50% of Scotland's total exports1.

Figure 1 Export intensities for Scotland and the United Kingdom (exports as a percentage of GDP)



Source: Scottish Government 2018a; Scottish Government 2018b; World Bank 2018a. Calculations by Authors

As a starting point in this analysis, Figure 1 provides export intensities for Scotland since 2002 relative to the UK as a whole. Exports as a percentage of GDP are approximately a third lower in Scotland compared to the UK. Note the drop in exporting from 2002 to 2006, attributable to the

[1] https://www.insider.co.uk/news/nicola-sturgeon-government-economy-programme-13191792

winding down of the predominantly foreign-owned, export-intensive ('Silicon Glen') electronics sector during this period. And while Scotland's export intensity has rebounded since this and the ensuing global financial crisis, it has not returned to the levels seen in 2002.

At the outset, then, this suggests there is a significant and continuous "export gap" between Scotland and the rest of the UK. This weak export performance may in turn be partly attributable to the country's weaker growth and productivity performance relative to the UK as a whole. It also raises questions about the international markets that Scottish exporters are serving and what insights such patterns might provide on the future export trajectories of Scotland. In line with this, the next section provides an examination of these export geographies.

II Scotland's export geographies

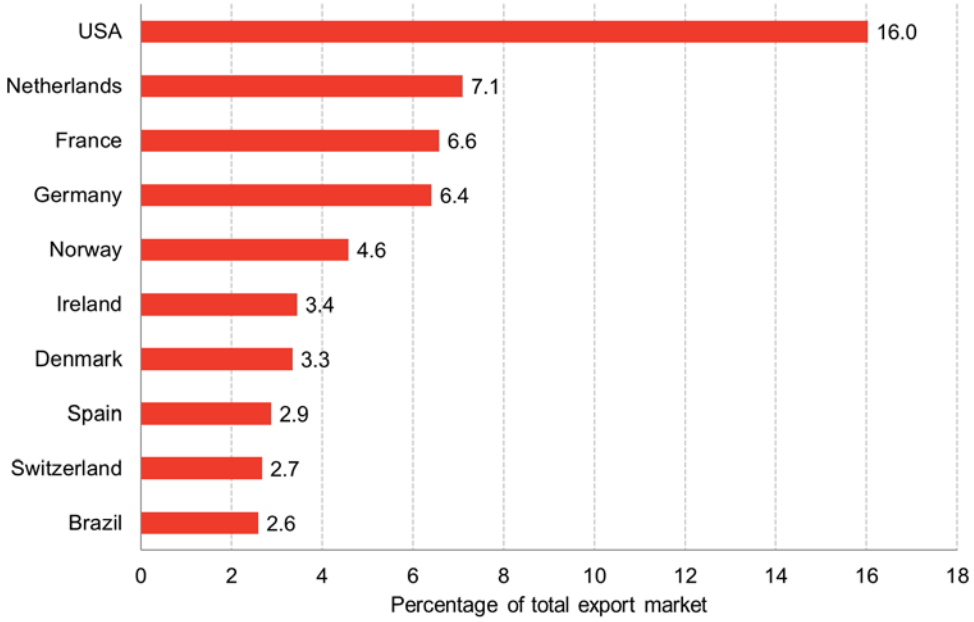
There is a growing amount of research on the markets to which firms export and how these are selected, largely because of how these geographies might help to provide an understanding of export strategies and innovation. A large body of evidence points to firms exporting to nearby, familiar, or long-time markets – a pattern that is especially salient for small-and-medium-sized firms (SMEs) (Bernard, et al, 2007; Defever, et al, 2015). That is, exporters tend to minimize risks and costs by accessing geographically proximate markets or those markets with which they or associated firms have some familiarity or affinity. Indeed, this is reflected in the famous "Uppsala model" which is used to depict how firms select geographically proximate foreign markets with low levels of "psychic distance" (Johanson and Vahlne, 2007).

Within this context, what is considered to be a nearby, or for that matter, a distant market? Ghemawat (2001) neatly categorised distance (in terms of international business) into four distinct categories: geographical, cultural, administrative, and economic. The reason that these types of factors are mentioned is that in many ways, they are germane to Scotland's export performance and to understanding its export geographies. What these frameworks suggest is that Scottish firms, especially less resourceful SMEs, typically favour neighbouring markets with low levels of geographical and physic distance.

Figure 2 provides an examination of the leading destinations for Scottish exports in 2016. Note that the United States is far and away the leading destination, accounting for 16% of total Scottish exports. Notably, the second leading export destination, the Netherlands, accounts for less than half of that (i.e. 7.1%). The reasons why firms choose (or do not choose) specific

markets are numerous. Many researchers attribute the volume of trade to the various forms of distance referenced earlier. In line with this, note that eight of Scotland's top-ten export markets are either in the European Union (EU) or part of the European Economic Area (EEA). In this sense, these leading export destinations reflect not only a sort of reduced geographical distance (i.e. relative proximity) but also, a form of administrative and psychic proximity. In other words, being within the same trade bloc brings economies closer together. The other two, top-10 export destinations, the US and Brazil, are large markets in their own right. With respect to the US, it has longstanding ties with Scotland, a point which also factors into a sort of cultural and economic proximity. Socio-economic and cultural affinities undoubtedly reduce the spatial distance between the Scotland and the US.

Figure 2 Scotland's top-ten export markets by percentage of total Scottish exports, 2018

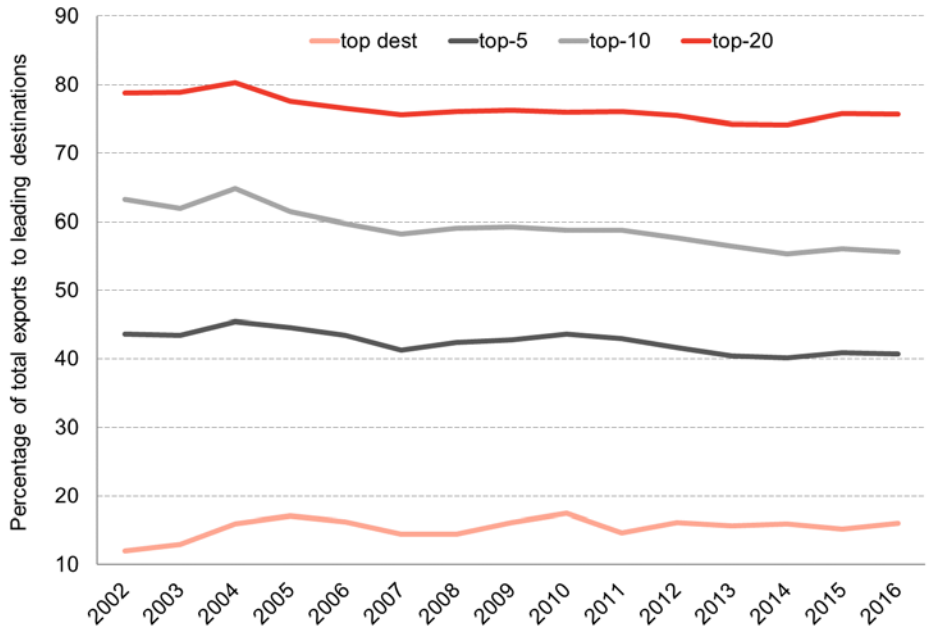


Source: Scottish Government 2018a

It is worth exploring whether Scotland is dependent on a comparatively select number of foreign markets. Figure 3 illustrates the export composition over time for leading, top-five, top-ten, and top-20 export markets. As discussed above, the leading market has remained the US and has accounted for approximately a sixth of total Scottish exports for some considerable time. There are somewhat noteworthy trends in the remaining three export groupings. Overall, there is a

trend towards increased foreign market diversification by Scotland's exporters. Note that the top-five, ten, and 20 markets reflect a slight decline over time in overall market concentrations. In essence, exports are not as concentrated among leading markets - bar the relative strength of the US as a leading export destination - and perhaps show some sign of export market diversification. One note of caution should, however, be provided with these findings. Exports to countries beyond the top-five to ten markets represent a comparatively small base on which to build. Brazil, for example, accounts for only 2.6% of total exports while the 20th-ranked market (South Korea), accounts for roughly 1.5%. So, although the apparent geographical diffusion of export markets is encouraging, exports to these new and emerging markets remain very small (see Slow et al, 2015). This point will be addressed later in the paper.

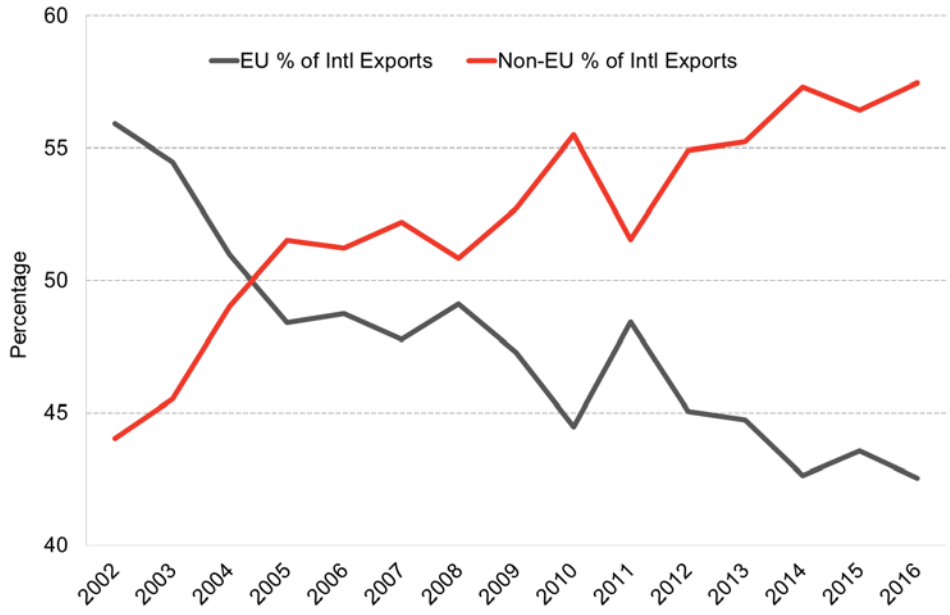
Figure 3 Composition of exports: percentage of total exports by leading destinations



Related to what was discussed regarding Figure 2, many of the leading markets for Scotland's exports are located within the EU. The UK's forthcoming departure from the EU is expected to have some negative impact on this, barring some sort of free trade area being created. While this separation is a topic that has already been discussed at length, its full effect on exports remain to be seen (Brown et al, 2018). As such, Figure 4 presents a comparison of EU versus non-EU export composition. Note that well over a decade ago, non-EU exports surpassed those

destined to the EU. There are numerous reasons for this changing spatial pattern, some of which can be attributed to the aforementioned decline of Scotland's electronics sectors and their connections to European supply chains. Indeed, much of the foreign-owned electronics sector specifically located in Scotland to target exports to the EU (Raines et al, 2001).

Figure 4 Composition of exports: EU versus non-EU



Source: Scottish Government 2018a; Calculations by Authors

With the decline of the electronics industry the trends clearly illustrate that there is a decreasing dependence on European markets for Scotland's exports. These findings are not presented to diminish the importance of EU markets to Scottish exporters, but rather to further illustrate a changing geography of exports from Scotland. And, far from providing conclusions, this raises additional questions about the strategies that firms are using to enter these new markets.

How do the geographies of Scottish exports fare as a whole? Table 1 shows the world's largest economies in terms of how these relate to Scottish exports. As mentioned in the discussions from Figures 2 and 4, the US remains the world's largest economy as well as the largest single destination for exports from Scotland. Additionally, Germany and France are the fourth and fifth leading export destinations, respectively. All three of these examples follow some sort of logic

in terms of export geography. In the case of the US, historic trading links and the size of the market are natural draws. In the case of Germany and France, geographical proximity and EU membership are conducive to trade.

Table 1 World's largest economies* in terms of Scottish export destinations

Country	Export Destination Rank 2016	Percentage of Exports 2016
United States	1	16.0
China	17	1.9
Japan	19	1.5
Germany	4	6.4
France	3	6.6
India	26	0.9
Brazil	10	2.6
Italy	12	2.4
Canada	15	2.1
South Korea	20	1.5

* Excluding the United Kingdom

Source: Scottish Government 2018a; World Bank 2018b; Calculations by Authors

Beyond these examples, however, the list does not match as well. The world's second and third-largest economies, China and Japan, rank as only the 17th and 19th largest as Scottish export destinations, with India ranking at 26th and accounting for less than one percent of Scottish exports. While each of the large (and relatively un-accessed) economies is unique in terms of export suitability, the point remains that there are a number of large and rapidly growing markets open to development by Scottish firms. Moreover, locations such as South Korea and Japan are well-developed markets with affluent consumer and industrial bases and both China and India have experienced rapid economic growth with the emergence of sizeable middle classes. The challenge then is to determine what barriers – in other words, what forms of 'distance' – prevent Scottish exporters from accessing and potentially benefitting from such large and/or growing markets.

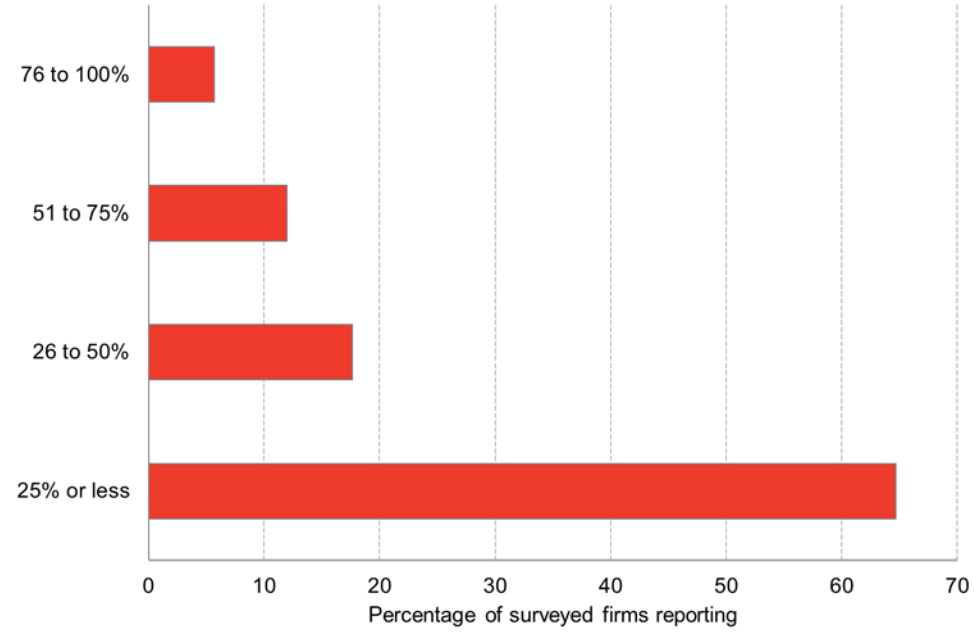
III Scottish SMEs and exports

The data presented above referred to Scottish exporters as a whole. We now turn to the export patterns of a particularly important cohort of firms: small and medium sized enterprises (SMEs). Smaller firms and their export dynamics have been at the centre of much academic and policy-led research over the past three decades, with much of this centreing on the difficulties that SMEs face in international markets (vis-à-vis larger firms) and the resulting export performance of these firms (Wright et al, 2007). Nonetheless, with SMEs accounting for more 99% of all firms in Scotland, the export performance of such firms is a highly topical issue (Nesta, 2017). This section takes a brief look at SME export performance in Scotland, based on 2015-2017 survey data from BDRC Continental's *Small- and Medium-Sized Enterprise Finance Monitor* (2018). Notably, just under 10% of the 3,841 SMEs based in Scotland indicated that they exported. While the export-related questions in this survey were somewhat limited (as the study focused largely on finance-related issues), the remainder of the analyses will look at the export performance of these 375 internationally-engaged Scottish SMEs.

As seen in Figure 5, over 60% of the surveyed SME exporters derive less than a quarter of their total sales from international markets. This is set against less than 20% of these SMEs earning more than half of their total turnover from exports. This export performance (or as some would posit, underperformance) is in line with all UK SMEs participating in the same survey. While these data are not surprising, they do suggest that there is room to grow in terms of export expansion for Scottish SMEs. As usual, however, the relevant issue is how to stimulate such export growth.

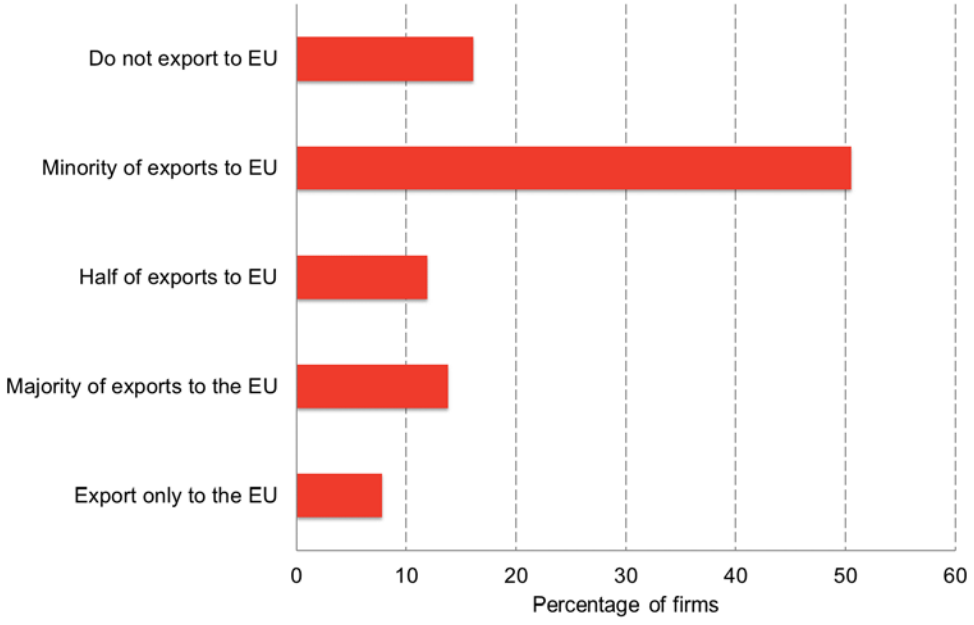
Related to this export performance and the need to grow markets is the forthcoming UK withdrawal from the EU. In light of this, Figure 6 offers results of the survey questions concerning a firm's approximate export composition concerning the EU. At this point, roughly 65% of the firms either do not export to the EU or derive less than half of their export sales from this market. So, while some SMEs could be negatively impacted by any loss of barrier-free access to the EU, the data suggest that a number of firms are also actively engaging markets outside of this trade area.

Figure 5 SME export intensity by percentage of total sales by surveyed firms



Source: BDRC Continental (2018)

Figure 6 Breakdown of Scottish SME exports to European Union



Source: BDRC Continental (2018)

Although the above data are useful, it is also informative to look at the breakdowns within these trade metrics. Table 2 offers a classification of export intensities within the EU export metrics discussed in Figure 6. While the results are mixed, a number of noteworthy findings emerge. First, SMEs exporting exclusively to the EU also tend to be among those deriving less than a quarter of their revenue from exports. Conversely, firms receiving half of their sales from EU exports tend to be much more export intensive. Recall that in Figure 6, over 60% of these SMEs earned a small portion of their export revenue from the EU or did not engage with this market. This group of the firms also tended to be far more export intensive overall, lending some support to previous findings that firms which engage more distant markets also tend to be better overall export performers.

Table 2 EU breakdown of exports by firm export intensity, percentage of firms

Destination	25% or less	26 to 50%	51 to 75%	76 to 100%
Export only to the EU	88.2	11.8	0.0	0.0
Majority of exports to the EU	66.7	18.5	7.4	7.4
Half of exports to EU	41.7	37.5	20.8	0.0
Minority of exports to EU	71.0	14.0	8.4	6.5
Do not export to EU	80.6	3.2	12.9	3.2

Source: BDRC Continental (2018). Calculations by authors

Table 3 International market expansion and export intensity, percentage of firms

	Planning to move into new markets abroad?	
Export intensity	Yes	No
25% or less	21.5	78.5
26 to 50%	40.9	59.1
51 to 75%	47.8	52.2
76 to 100%	43.8	56.3
All firms	29.0	71.0

Source: BDRC Continental (2018). Calculations by authors

Table 4 International market expansion and European Union export breakdown (percentage of firms)

	Planning to move into new markets abroad?	
Export Composition	Yes	No
Export only to the EU	25.0	75.0
Majority of exports to the EU	40.9	59.1
Half of exports to EU	36.8	63.2
Minority of exports to EU	23.2	76.8
Do not export to EU	29.2	70.8

Source: BDRC Continental (2018). Calculations by authors

An additional survey question asked whether these firms planned to engage new markets in the upcoming year in either the UK or abroad. Table 3 provides a look at the overseas component of this question, couched in terms of the export intensities. Perhaps the most interesting and somewhat alarming result is that overall, only 29% of the SMEs planned to move into a new international market in the next year. In a sense, this does not bode well for the expansion of Scottish exports. However, given that over 60% of these firms have export intensities less than 25%, the results are somewhat skewed by this group of SMEs. On the other hand, firms that are more export-intensive (i.e. greater than 25% exports) also tend to be among those showing a higher propensity to engage with a new international market. In each export grouping, note that at least 40% indicated that they would do so. The 'new market' question was also juxtaposed with the EU export market question, as seen in Table 4. While the results are somewhat varied, it is important to note that for firms with a majority of exports destined to the EU, fully two-fifths intend to engage with a new international market – the highest number among these groupings. This would suggest that such firms are looking to diversify their export market portfolio in a time of relative economic uncertainty.

IV Looking ahead: increasing trade development in the post-Brexit era

This paper has shown that Scotland faces an export deficit compared to the rest of the UK as a whole. Scottish SMEs seem especially internally focused: only a small minority export and the

majority derive less than a quarter of their total sales from international markets. Addressing these complex challenges is exacerbated by the complex operating environment confronting firms at the present time, especially related to Brexit-induced uncertainty and the wider hostile international trading environment since the election of the Trump administration in the US.

What this suggests is that policymakers may have to become much more proactive to alleviate these challenges if Scotland is to overcome this export deficit and stimulate export expansion among SMEs. To achieve this, the Scottish Government may wish to further prioritise overseas internationalisation over other (often more resource-intensive) economic development initiatives such as infrastructure or flagship higher education commercialization efforts (Brown et al, 2016). The key benefit from concentrating support towards SME internationalisation owes to the fact that many externally-focused SMEs are often the most growth-focused firms which generate substantial economic benefits for local economies, most notably "jobs" (Mason and Brown, 2013).

While Scotland underperforms in terms of exporting, there also seems to be a strong recognition that the UK's export performance as a whole underperforms relative to its European peers. In terms of longer-term strategic forms of assistance to encourage SME internationalisation, policy makers may have to implement a much more expansive and well-resourced overarching export strategy for Scotland. Indeed, the UK government is currently developing a new export strategy to build on the recent economic strategy "Building our Industrial Strategy" (BEIS, 2017). A key starting point within this work is the acknowledgement that while less than one in ten UK SMEs currently exports, almost the same number (an estimated 300,000 SMEs) have the capacity to internationalise. This would suggest that roughly 30,000 Scottish SMEs may have some kind of capacity to become internationalised. Targeting such dormant or "discouraged" exporters seems to be a highly worthwhile policy objective.

In view of the need for more firms to engage with international markets, what type of initiatives could (or should) be developed to encourage exporting, especially among SMEs? The first policy task is to motivate non-exporters (or infrequent exporters) to explore international markets. This may be easier said than done. The export challenge is especially salient for SMEs, due to challenges such as limited capital for exploring international markets (whether in terms of onsite visits or trade fairs), obtaining export market intelligence, or even securing the capital to expand production for export sales. Organisations such as Scottish Development International have been developing programmes for years on this front. Perhaps more could be done to encourage

SMEs to take the initial foray into global markets. Export initiatives such as the *TR&DE* program by the former UKTI have worked in various locations to provide seed funding for SMEs to explore international markets (Kalafsky, 2017). Other development-trade organisations have encouraged (and helped to fund) SMEs to attend trade fairs as vehicles to access a wider international customer base. Regardless, taking the initial leap into international markets is an important first step.

Just as important is the need to encourage SMEs to persevere when export markets do not work out well the first time. Many firms become discouraged after initial export explorations do not turn out as planned. So in addition to helping non-exporters to export, policymakers and trade development officials could look for ways in which to support SMEs that have lower export intensities or have pulled back from international markets altogether due to previous negative experiences.

A second equally important policy challenge concerns the geographies of export markets. Simply put, are there policy-led means to catalyse firms to explore new and/or emerging markets that are not currently served by most Scottish exporters? As discussed earlier in this paper, almost one-sixth of Scottish exports are destined for the US alone, with concentrations in nearby European markets. Moreover, the data in this paper suggests that many large and/or emerging global markets receive relatively little attention from Scottish exporters. Beyond the initial jump to exporting discussed above, how do firms engage with new markets? This again is a question of supporting firms (especially SMEs) in terms of obtaining intelligence of international markets. Beyond standard prescriptions and information sources such as these, again it may entail actively motivating promising exporters to go to faraway locations. Firms can attend trade fairs located domestically or internationally to find these customers. While the trade fair solution is a possibility, it is not always within the realm of possibilities for many firms. Indeed, SMEs have cited the costs of participating in trade fairs as an impediment to exporting (Kalafsky and Duggan, 2016). While trade fairs and the like may indeed be the 'cost of doing business' in international space, perhaps greater levels of incentives could be offered to help leverage access into new and emerging markets.

Of course, a critical factor shaping the current exporting environment is the indeterminate nature of Brexit. Brexit is so polyvalent, pervasive, and entrenched across so many sectors it is difficult to exaggerate its potential impact. Research strongly shows that Scottish firms, especially Scottish SMEs, are deeply concerned about the potential negative impact of Brexit. Compared

to other parts of the UK, Scottish and Northern Irish SMEs note particularly strong concerns about Brexit (Brown et al, 2018). While examining the policy implications of Brexit is well beyond the scope of this paper, what seems certain is that Brexit is likely to have a profound impact on the trading environment facing Scottish firms for years to come.

Taken in one sense, it can be (and for the most part has been) viewed as an existential threat for Scotland's exporters in view of the fact SMEs typically engage with comparatively nearby or adjacent EU markets. In this regard, this could be problematic as there is often a considerable lead time needed to successfully engage international markets, especially those in which the firm has little or no experience. On the other hand, viewed more optimistically, it could be an opportunity for Scottish exporters. If indeed the UK is no longer joined in some sort of common market or free trade area (which is still in flux), then firms may be compelled to find new and in most cases, distant, markets. At the same time, the 'distance' of such markets might be manifested in various ways: cultural, regulatory, and other ways beyond mere geography. In particular, this is an area in which policy-led support could help the most in terms of gathering market intelligence and easing the difficulties of entering a market.

That said, irrespective of the outcome of the Brexit process, neighbouring EU markets will remain critical for the Scottish economy. Therefore, alleviating the negative impact of Brexit is crucial for enhancing the long-term competitiveness of many export-oriented Scottish SMEs. Positively, this has been recognised by the Scottish Government who have been one of the first devolved administrations to proactively offer a bespoke Brexit-related subsidy to SMEs exporters to the EU2.

Commendably, the Scottish Government recently created a new bespoke ministerial portfolio specifically designed to assist the development of Scotland's wider trade-related efforts and to cultivate associated political and commercial interests overseas. This is an important step in the right direction towards nurturing a stronger policy focus on improving Scotland's weak export performance. However, part of the problem facing policy makers is a lack of concrete evidence on how best to develop international trade. Therefore, undertaking an enquiry (similar to the famous 1990s Business Birth Rate Enquiry) around exports might be a useful step towards enhancing the evidence base around the underlying causal factors contributing to Scotland's

[2]The pilot scheme launched in Scotland enables eligible SMEs a subsidy of £4,000 to assist with exporting to EU markets. Details of the scheme appear at: https://news.gov.scot/news/preparing-business-for-brexit

historical export underperformance. More immediately, what seems certain is that policymakers are likely to have to provide an important cushion against the arduous Brexit headwinds facing Scottish exporters, especially if the country's weak export performance is to be improved in the years to come.

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Monetary and fiscal policy in a newly independent Scotland: lessons from the dissolution of Czechoslovakia?

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Abstract: This paper looks at the creation of the Czech Republic and Slovakia and its transitionary monetary union to illustrate the challenges - and opportunities - that a newly independent Scotland might face. The paper provides a background to the economic consequences of the dissolution on both the Czech Republic and Slovakia, their divergent paths in terms of economic policy and growth and the reasons why their monetary union was short-lived. The lessons from this experience are then drawn with regard to the issues that might face a newly independent Scotland, were policy to follow the recommendations of the recent Sustainable Growth Commission report. Though not strict parallels, the economic experience of the dissolution of Czechoslovakia does have some lessons for a newly independent Scotland to consider.

I Introduction

The recent Sustainable Growth Commission report sets out the vision that Scotland could retain the pound sterling for an extended transition period after Scotland gains political independence from the UK. Clearly, retaining the pound post-independence would reduce transaction costs such as the costs of currency conversion or the need for businesses to revalue their assets and liabilities. Furthermore, it could help reduce exchange rate uncertainty and help ensure that business and consumer confidence remains in place immediately after independence. However, the question of whether there would be fiscal and macroeconomic tensions between Scotland and rUK post-independence would be crucial for the sustainability of any transitionary monetary union. There are few international case studies that can be used to judge the success or otherwise of monetary union between two countries. An interesting example is the dissolution of Czechoslovakia in 1993 and the monetary arrangements that followed. The creation of the Czech Republic and Slovakia is sometimes referred to as the "two-step break up", as it involved first the political creation of the Czech Republic and Slovakia on 1st January 1993 and a subsequent creation of an independent monetary position 38 days later on 8th February 1993.

This paper discusses the background of how the Czechoslovak transitory monetary union was formed, its fiscal implications, how the monetary union ended, and how the two countries fared in the years afterwards. This paper will also discuss the main lessons for a newly independent Scotland, such as the importance of expectations of financial markets and the need for symmetric macroeconomic developments with the rest of the UK for the sustainability of a transitory monetary union.

II The Czechoslovak transitionary monetary union

The *federal* state of Czechoslovakia was a twentieth century construct and dates back to 1918 when it was created in the aftermath of the dissolution of the Austro-Hungarian Empire. During the Second World War, the state split with the First Slovak Republic created as a satellite state of Germany, with limited sovereignty. Subsequent seizure of power by the Communist Party of Czechoslovakia after WWII led to the reunification of Czechoslovakia as a *unitary* socialist state under Soviet influence. During the Prague Spring in 1968 however, the Constitutional Law of Federation reinstated Czechoslovakia's official federal structure, which promised a common state consisting of two equal nations. However, despite its federal structure, the communist government concentrated its centralised power and policy-making powers in Prague, which led to the build-up of discontent amongst many Slovaks.

The modern day dissolution of Czechoslovakia was a result of the 1992 parliamentary elections. The decision to dissolve Czechoslovakia was taken by then Czech Prime Minister Vaclav Klaus and Slovak Prime Minister Vladimir Meciar, as a political decision without the constitutional backdrop of a referendum. At the time, the main points of disagreement between the Czech and Slovak governments were the redistribution of power between the federation and constituent republics and the design of future reforms. In order to mitigate the immediate negative economic effects of the dissolution of Czechoslovakia, such as an abrupt decline in bilateral trade or cross-border investment, the decision was taken to retain a common currency, a customs union, and a common labour market. The monetary union would see both countries retain the Czechoslovak crown for a period of six months with further extensions to be considered after this period.

The monetary union agreement stipulated that each side had the option to withdraw from the union if: (1) the fiscal deficit of either country exceeded 10%; (2) foreign exchange reserves in either country fell below one month's worth of its imports; (3) inter-country capital transfers

exceeded 5% of total bank deposits; (4) the Monetary Policy Committee was unable to reach agreement on fundamental monetary policy issues (Fidrmuc, Horvath, and Fidrmuc, 1999). The former monetary policy authority, the State Bank of Czechoslovakia (SBCS), was replaced by an independent central bank for each country and a joint monetary board was established with a 50:50 representation from each central bank to take decisions on joint monetary policy.

III Fiscal implications of the monetary union and independence

It is hard to judge the immediate fiscal impact of the monetary union on both countries' economies due to its (very) short-lived existence. However, post the ending of the monetary union in February 1993, both the Czech Republic and Slovakia experienced a recession with Czech GDP falling by 1% and Slovak GDP falling by 4% (Fidrmuc, Horvath, and Fidrmuc, 1999). To a large degree, this was a reform-induced recession associated with the transition from centrally planned economies to free-market economies. The contraction in GDP could have also been partly induced by the after-effects of the 1991 global recession. Nevertheless, the costs associated with building new institutions, the decrease in mutual trade, and the cessation of any fiscal transfers between the two countries also contributed to the deepening of the recession. According to Sujan and Sujanova (1994), the overall costs associated with the dissolution were 2.1% of Czech and 5.7% of Slovak GDP.

The liabilities of the federal state, such as banknotes, commercial bank reserves held by the federal central bank, and debt obligations towards the IMF, were divided 2:1 according to the population ratio between the Czech Republic and Slovakia. Immovable assets were taken over by the country where they were located with all other assets being divided by their population ratio. Throughout the post-war history of Czechoslovakia, Slovakia had consistently been a net recipient of fiscal transfers from the Czech Republic. The estimates of the size of the net fiscal transfer in 1992 vary in size from 13.5 billion Czechoslovak crowns (CSK) (Hajek et al., 1993) to CSK 25 billion (OECD, 1994), equivalent to between 4.4% and 8% of Slovak GDP. Given the non-zero sum nature of the fiscal transfers, with the dissolution of Czechoslovakia the Czech Republic gained and Slovakia lost the value of the implicit liability to continue these fiscal transfers into the future.

IV The ending of the Czech / Slovak monetary union

The abrupt ending of the Czech / Slovak monetary union was associated with underlying and long-term structural tensions between the countries' economies and immediate developments around the dissolution of Czechoslovakia. Firstly, the monetary union and the Czechoslovak crown failed to achieve credibility in the financial markets. The newly-established joint monetary committee was comprised of the governors and two senior officials from each central bank. However, as the markets correctly anticipated, the countries' divergence in macroeconomic variables such as unemployment and GDP growth before and after the dissolution of Czechoslovakia made decisions in pursuit of the common interests of the single currency impossible. Higher unemployment and weaker growth meant that Slovak authorities were in favour of lower interest rates and competitive devaluation of the Czechoslovak crown, whereas this was clearly not in the best interest of their Czech counterparts. Although the decisions on monetary policy were made by the joint monetary committee, the implementation of policy decisions was left to the national central banks. This contributed to a dysfunctional institutional design for conducting monetary policy and led to an undermining of the Czechoslovak crown's credibility on financial markets.

This lack of credibility was expressed in a parallel exchange rate of the Czechoslovak crown relative to the US dollar (i.e. the exchange rate quoted by commercial banks) which climbed to be 78% higher than the official exchange rate (Firdmuc, Horvath, and Fidrmuc, 1999). Furthermore, due to the poor competitiveness of the Slovak economy relative to its neighbours, a devaluation of the new Slovak crown was expected at the end of the 6-month transition period. In anticipation of this, large capital outflows from Slovak to Czech banks occurred in late 1992 and at the beginning of 1993. Furthermore, Slovak importers sought to repay their debts as soon as possible, while Czech importers wanted the exact opposite. The gradual outflow of currency from Slovakia to the Czech Republic further worsened the tensions associated with the single currency, as Slovak banks were prone to significant reductions in their liquidity[3] which threatened to force them into insolvency, were no government action taken.

[3] The impact of severe decline in back liquidity, such as in the 2008 banking crisis, demonstrate the severely destabilising effects for the real economy.

A single currency maximises economic efficiency if the region where it is used is an 'optimum currency area'[4]. The Czechoslovak experience suggests that the two countries were not an optimum currency area and that there were several asymmetric developments in the two economies. Optimum currency area literature argues that labour mobility is a key adjustment mechanism in the event of asymmetric shocks (Mundell, 1961). In the event of an asymmetric shock, such as a decrease in demand for goods in a country, high labour mobility can bring the goods market back into equilibrium by workers migrating to another country and reducing the natural rate of unemployment in the domestic country. However, if labour mobility is low, the adjustment must come through higher prices and lower wages. The data from Czech Republic and Slovakia suggests that there was a low degree of inter-regional / inter-country labour mobility. This magnified the pre-existing, pre-dissolution macroeconomic impacts of the differences in unemployment rates between the two countries. In December 1992, the unemployment rate was 2.6% in the Czech Republic and 10.4% in Slovakia. Close to a year after the dissolution, in December 1993, the difference had increased even further; Czech unemployment increased to 3.5% and the Slovak rate increased to 14.4% (Fidrmuc, Horvath, and Fidrmuc, 1999).

Industry specialisation and the synchronisation of business cycles are also important factors for a successful optimum currency area. The incidence of asymmetric shocks is much smaller in a diversified economy than in a specialised one. In the case of Slovakia, most of its industry was built in the period after the 1948 communist takeover with a focus on heavy engineering, metallurgy, and the chemical industry (Pavlinek, 1995). The communist political objectives were also mirrored in the reliance on the military equipment industry where a substantial amount of exports was directed to the former Soviet bloc. On the other hand, Czech industry was more diversified and focused on high value-added sectors. The reliance of Slovakia on heavy and military industries may have amplified the asymmetric shocks which in turn contributed to the collapse of the monetary union.

[4] The theory of 'optimum currency area' was first introduced by Mundell (1961) and shows that countries should join a monetary union if the costs of doing so are lower than the benefits. The four main criteria for a region to form an optimum currency area are: (1) an integrated labour market where labour can move freely, (2) flexibility of pricing and wages, along with mobility of capital, (3) A redistribution mechanism to redistribute capital to parts of the area that have suffered because of labour and capital mobility, (4) a synchronisation of business cycles between the participating regions or countries.

A lower correlation of permanent output shocks (i.e. long-term trends in GDP growth between the two countries) can be a destabilising factor for a currency union. If countries in a currency union do not have synchronised business cycles the central bank will struggle to offset economic recessions and contain inflation for the whole area. Data suggests that the correlation of permanent output shocks between the Czech Republic and Slovakia ranged from 0.34 and 0.53 for different time periods between 1948 to 1990 (Fidrmuc, Horvath, Fidrmuc, 1999). This was much lower than other monetary unions such as the US, where the correlation of permanent output shocks ranged from 0.69 to 0.86 (Fidrmuc, Horvath, Fidrmuc, 1999). These developments suggest that the monetary union was experiencing structural tensions throughout its history that were further amplified after the dissolution of Czechoslovakia. These factors created macroeconomic imbalances which it is argued contributed to the collapse of the post-dissolution transitionary monetary union.

V The path from monetary union to the Eurozone

The fortunes of Slovakia and the Czech Republic after dissolution were very different in the 1990s. The Czech Republic pursued a path of reform and market liberalisation that led it to achieve economic success in the late 1990s, while Slovakia remained stuck in a period of secular stagnation with a government led by Prime Minister Meciar which had no enthusiasm for reforms. Despite averaging economic growth of 6% between 1994 and 1996 and over 4% until 1998, the Slovak economy remained fragile and on an unsustainable path (Šuster, 2004). The output gap created by the 1991 recession was finally overhauled by 1996, but growth was fuelled mainly by expansionary fiscal policy (Šuster, 2004). As expected, this expansionary fiscal policy was associated with a high government deficit (4.7% in 1998) and a build-up in government debt (28.9% of GDP in 1998, up from 11.5% in 1996). Long-term unemployment continued to grow with the unemployment rate reaching a high of 15.6% in 1998 (Šuster, 2004). After the 1998 election a reformist government took power and started to modernise the Slovak economy. Bold free market reforms and fiscal policies aimed at stabilising government debt to fulfil the Maastricht criteria enabled the start of Slovakia's entry to European Union (EU) in 2004. Subsequently, tax breaks and tariff breaks, subsidies for new employment and government commitments to build infrastructure were made. This helped draw in foreign direct investment (FDI), particularly into the car industry. This significant increase in FDI contributed to Slovakia posting the fastest economic growth in Central Europe with it being nicknamed the "Tatra Tiger".

During its entry into the EU, Slovakia committed to adopt the Euro once it had fulfilled the conditions set out in the Maastricht Treaty. Market-induced reforms of the early 2000s changed the structure of the Slovak economy and enabled convergence in macroeconomic variables towards the EU average. During the transition period, agriculture and industry, lost a great deal of their share of the economy, while services gained significantly (National Bank of Slovakia, 2003). The reforms and transformation of the Slovak economy enabled the country to join the Eurozone in 2009. Zudel and Melioris (2016) estimated that by adopting the Euro, Slovakia gained a 10% boost in real GDP per capita by 2011. The benefits came mainly from the reduction in transaction and administrative costs and an increase in FDI and trade with key partners such as Germany.

In 2004, both the Czech Republic and Slovakia joined the EU, but the Czech Republic decided not to adopt the Euro. The decision was a policy choice of Czech government and was based on the backdrop of beliefs by the Czech National Bank that real economic convergence towards the Euro area in areas such as price stability and industry specialisation had not been sufficient (MoF CZ and CNB, 2017). As shown in the chart below, in the years immediately after the adoption of the Euro, Slovakia achieved higher GDP growth than the Czech Republic. Despite other factors (e.g. public spending providing a boost to aggregate demand) which could have contributed to this difference, it is clear that Slovakia benefited from adopting the Euro.

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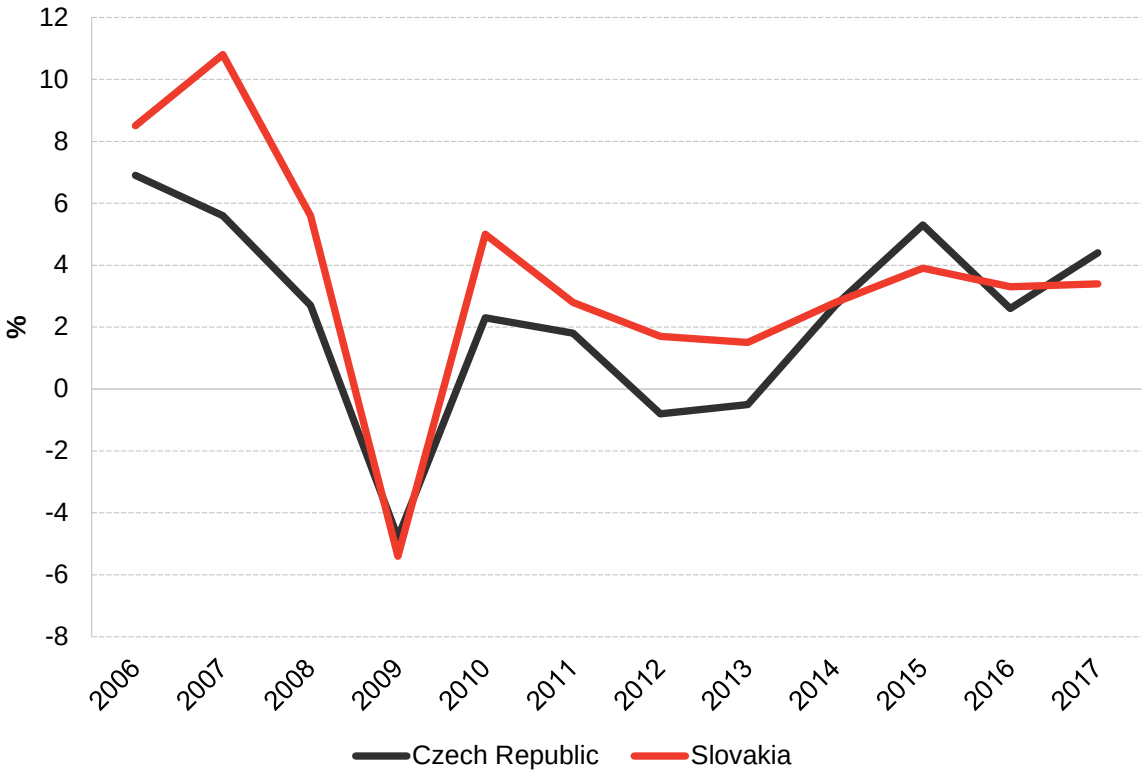
Figure 1 Real GDP growth rate in Czech Republic and Slovakia



Source: Eurostat

VI The Sustainable Growth Commission and the Scottish context

The Sustainable Growth Commission (2018) report suggests that a newly independent Scotland would need to achieve a substantial reduction in in its fiscal deficit to gain credibility in the markets and at that point it could make an orderly transition to a new currency.

The report suggests that Scotland retains the pound sterling for an extended period after any vote for independence. During this period Scotland would face an interest rate regime set by the Bank of England. The Sustainable Growth Commission suggests that after the 'transition period' Scotland would establish its own 'new' currency. The report offers a roadmap and sets out plans for financial regulation, banking, and the creation of a Scottish Central Bank (Sustainable Growth Commission. 2018). The Czechoslovak experience shows that if two newly independent countries face one interest rate, but their economies start diverging in terms of macroeconomic variables (e.g. GDP growth, inflation, unemployment, fiscal deficit) the central bank might find it difficult to set an interest rate which will be suitable for economic conditions in both countries.

Scotland and the UK outside of London, share broadly similar characteristics. Key economic indices for Scotland tend to be similar to the UK average, albeit the London-effect does pull the UK number higher. The structure of the two economies are more similar than in the Czech and Slovak case, although the existence of oil in the Scottish economy is one key difference. However, whilst there may be economic similarities, the Czechoslovak case highlights how any meaningful differences, whether at the outset of independence or building up over time, have the potential to unsettle the underlying monetary union. Indeed, if the very purpose of independence is to build a different economy to the UK, then it necessarily follows that the system will become less stable.

As highlighted earlier, Slovakia was a net recipient of fiscal transfers before 1993, with estimates of the size of the transfer varying from between 4.4% to 8% of GDP.

The Sustainable Growth Commission (2018) concedes that a newly independent Scotland would inherit a substantial fiscal deficit of circa 6% of GDP and it sets out a plan for reducing the deficit over a 10-year period. However, any 'new' Scottish currency would need to gain credibility in the financial markets on the day after independence. Given an expected fiscal deficit of such a scale, there is a risk that financial markets could put the 'new' Scottish currency under substantial pressure.

VII Conclusions

The story of the dissolution of Czechoslovakia shows that transitionary monetary unions can be, depending on pre-existing circumstance, unstable. The main economic factors that led to the collapse of the Czechoslovak currency union were a low correlation of permanent output shocks, low labour mobility and a mismatched industrial composition (e.g. a higher concentration of heavy and military industries in Slovakia compared to the Czech Republic). A dysfunctional institutional design for monetary policy and pressure from the financial markets led to the rapid collapse of the Czechoslovak crown. Despite the fact that the Czechoslovak experience is an interesting case study of the feasibility of a monetary union after the split of two countries, it does need to be viewed within a wider economic, political and social context.

It needs to be remembered that the Czech Republic and Slovakia were centrally planned economies for over 40 years prior to their attempt at sustaining a monetary union. Transition economies of such nature face many structural issues which the UK and Scotland simply would

not, given over 300 years of political union and over 100 years of democracy and stable institutions. The path of market liberalisation and reforms after the monetary union collapsed led to faster growth in the Czech Republic relative to Slovakia. It was only with radical reforms in the early 2000s that led Slovakia to become the "Tatra Tiger". The sustained convergence in macroeconomic variables towards the EU average allowed the country to complete its successful entry into the EU in 2004 and into the Eurozone in 2009, which have underpinned Slovakia's success story to date.

The Czechoslovak monetary union experiment shows that even small structural differences between two economies can make them more vulnerable to asymmetric shocks and will make the creation of a stable optimal currency area difficult. If Scotland was to remain part of the Common Travel Area, high labour mobility between Scotland and the rest of the UK could act as an adjustment mechanism to offset some of any macroeconomic imbalances.

Whatever decision is taken however, perhaps the most significant lesson is that the expectations and behaviour of financial markets – like it or not – need to be borne in mind at all times. This will be true whether trying to maintain a monetary union or introducing a new Scottish currency.

In summary, the Czechoslovak experience shows that the post-independence transitionary monetary union proposed by the Sustainable Growth Commission in Scotland could face challenges. At the same time however, the Slovak experience shows that with the right mix of institutional reforms accompanied with membership of the EU and Eurozone, there is a route to economic growth and increases in living standards.

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Highlighting the need for policy coordination: the economic impacts of UK trade-enhancing industrial policies and their spillover effects on the energy system

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Abstract

The wider impacts of energy policy on the macro-economy are increasingly recognised in the academic and policy-oriented literature. Given the interdependence of energy and the wider economy, any economic policy change will impact on the energy system. However, such 'spillovers' on the energy system have not been extensively researched. This article analyses the impact of export promotion policies - a key element of the UK's Industrial Strategy - on the energy system and energy policy goals. As the impacts of such policies are, in large part, transmitted via their effects on the economy, we use a computable general equilibrium model - UK-ENVI – to fully capture impact. Our results suggest that an across-the-board stimulus to exports

significantly increases total energy use, not directly via energy exports but indirectly via linkages between the energy sector and other sectors. We show that export-led growth has significant impacts on energy use and, in turn, on emission targets. Policy makers need to be aware that the successful implementation of the UK Industrial Strategy may create significant tensions with the UK's Clean Growth Strategy and wider energy policy goals. The scale of such impacts depend upon both the mix of UK goods and services exports and the success of low-carbon policies. A knowledge of the nature and scale of the spillover effects of economic policies on the energy system provides a platform for more effective and efficient policy making.

1. Introduction

The wider impacts of energy policy on the macro-economy are increasingly recognised in the academic and policy-oriented literatures. Within policy communities there is a developing recognition that the wider impacts of energy efficiency policies should be taken into account as proposed in the "multiple benefits" approach of the International Energy Agency (2015), rather than focussing exclusively *per se* on energy (and emissions) savings.

Indeed, some governments emphasise energy efficiency improvements explicitly as economic development policies (e.g. the Scottish Government, 2017), as well as a potential source of energy savings. Of course, these developments reflect the fundamental interdependence of energy (and emissions) and the economy: policy actions in any one system generate spillover effects in the other. Neglect of this interdependence may prove problematic for policy.

The interdependence of the energy systems and the economy naturally also implies that any changes in the economy impact on the energy system. The experience of the Great Recession, for example, provides dramatic evidence of such dependence, with total UK energy consumption falling by over 6% between 2008 and 2009 when the UK economy contracted by around 4% (BEIS, 2017a). However, these spillovers are not necessarily negative, and "double dividends" (or even "multiple benefits") are possible, where policies simultaneously stimulate economic activity and reduce emissions (and potentially also contribute to other policy goals).

While this interdependence is, of course, widely recognised, it has not featured prominently in assessing the likely impact of economic policies, such as industrial and fiscal policies: such assessments have tended to focus on the primary economic objectives of such policies, including their impact on Gross Domestic Product (GDP) and employment.

In principle, (non-energy) economic policies are likely to have a significant influence on the energy system, the neglect of which may lead to inefficiencies in the design of appropriate energy and economic policies. The importance of this in practice depends on the strength of the interdependencies between both systems and, in particular, the scale of the impact of economic on energy policy goals.

Our primary focus is on the comparatively unexplored impacts of economic policies on the energy system and their effects on energy policy goals such as energy use (and emissions), energy intensity and energy security. However, the impacts of such policies are, in large part, transmitted via their impact on the economic system, so that we have to adopt an approach that fully captures such interdependence.

In this article we analyse the potential impacts of successful UK industrial, business and innovation policy on the UK economic and energy systems, as well as the corresponding energy policy goals. Two key pillars of the UK Industrial Strategy are concerned with 'encouraging trade' and 'boosting productivity' (BEIS, 2017b). Although 'trading more, not less' seems to be key, precise policies or quantifiable measures are not explicitly stated[5]. Despite being concerned with coordinating policy, the strategy does not consider explicitly trade-offs (or complementarities) across policies, and how such tensions and conflicting demands could be overcome. As we illustrate in analytical and empirical analysis, increasing trade has a significant impact on the energy system, and energy policy goals in particular. This analysis therefore has two objectives; first, to explore how economic policies impact the energy system, and, second, to demonstrate the potential usefulness of the CGE modelling approach in capturing and quantifying the interdependencies between the economy and energy systems.

Here we analyse the system-wide effects of successful export strategies on the economy and the energy system. As part of a UK Energy Research Centre (UKERC) project we are also investigating the 'the economic impacts of UK labour productivity-enhancing industrial policies and their spillover effects on the energy system', and the impacts of UK (and Scottish) fiscal policies on the energy system, which we shall publish in due course.

[5] Although the recently published UK Export Strategy (DIT, 2018) now sets a target to "raising exports as a proportion of GDP from 30% to 35%". We shall explore in future the system-wide implications of reaching this target. However, the Export Strategy currently does not provide detail on the precise policy instruments used.

We employ a multi-sectoral computable general equilibrium (CGE) approach which captures the interdependence of the economy and energy systems and allows us automatically to track the impact of key energy and economic policy interventions on the main goals of both sets of policies and so can be used ultimately to develop a more *holistic* perspective on the conduct of policy. In particular, the intention is ultimately to create a framework that explicitly recognises, and seeks to quantify, the scale of spillovers from economic and energy policies to energy and economic policy goals respectively. Where these spillovers prove to be significant, accounting for them through better coordination of economic and energy policies would create the potential to deliver improved outcomes for both.

This article is organised as follows. Section 2 gives a brief overview of our energy-economy-environment model of the UK economy, and the simulation strategy. We present results in Section 3, and brief conclusions in Section 4.

2. Model and simulation strategy

In practice it seems likely that the Export Strategy will involve sectoral targeting of export promotion and this could have a significant influence on the impact on both the economic and energy sub-systems. However, since at the time of writing these sectors have not been identified explicitly, we focus here on an across-the-board stimulus. Such stimulus would increase exports as a proportion of GDP, which is currently an explicit target within the strategy. Accordingly, for now we proxy the impact of a successful trade-enhancing policies by an exogenous (and costless) 5% increase in international export demands across all sectors.

We simulate the economic and energy system impacts of such an increase in international export demands using a computable general equilibrium (CGE) model of the UK, UK-ENVI. Ross et al., (2018) provide a detailed description of the main characteristics of the model, with a particular emphasis on the linkages between the economic and energy sub-sectors, and a full mathematical account of the model.

For our analysis, however, it is important to note that we consider a number of alternative labour market closures, so as to reflect alternative visions of how the UK labour market operates. We do this for two main reasons. First, there exists genuine uncertainty about the way that the aggregate UK labour market currently operates and there has been considerable controversy surrounding the issue (e.g. Bell & Blanchflower, 2018). Secondly, we wish to check the extent

to which spillovers from economic policies to the energy system vary with alternative visions of UK labour market behaviour. This allows us, as far as is practical within the UK-ENVI model, to check that our conclusions are robust with respect to the choice of any particular model of the UK labour market.

2.1. The labour market

Our default model specification embodies a wage curve which reflects an inverse relation between the rate of unemployment and the real wage. Wages are thereby determined within the UK in an imperfectly competitive context, according to the following bargained real wage (BRW) specification:

$$\ln\left[\frac{wb_t}{cpi_t}\right] = \rho - \varepsilon \ln(u_t) \quad \text{where } wb_t = \frac{w_t}{1+\overline{\tau}_t} \tag{1}$$

In equation 1, w_t / cpi_t is the real take home wage, ρ is a parameter calibrated to the steady state, ε is the elasticity of wage related to the level of unemployment, u_t, and $\overline{\tau}_t$ is the income tax rate. So here the real consumption (after tax) wage is negatively related to the rate of unemployment (Blanchflower & Oswald, 2005), which is an indicator of workers' bargaining power.

The working population is assumed to be fixed and exogenous. This model implies the presence of involuntary unemployment (with BRW lying above the competitive supply curve for labour).

Conventional CGEs of national economies often make the simplifying assumption of an entirely exogenous labour supply (with both population and the participation rate invariant): that is labour supply exhibits a zero elasticity with respect to the real wage. This exogenous labour supply (ELS) vision of the market implies that employment is fixed.

$$Ls = \overline{Ls} \tag{2}$$

Of course, this vision of the labour market implies that the UK operates under a very tight supply constraint. Note that, in the short run, both capital and labour are fixed in each sector in this case, and so too is value-added. Aggregate GDP can only vary in response to disturbances that alter the allocation of activity across sectors. Furthermore, employment is effectively fixed even

in the longer-term, and is, of course, invariant to any change in demand, although capital stocks can adjust in response to changes in rental rates.[6]

Some take the view that workers in the UK bargain to maintain their real wage - 'real wage resistance' - that results in a fixed real wage (FRW) model (at least in the absence of productivity growth). This model implies:

$$\frac{w_t}{cpi_t} = \frac{w_{t=0}}{cpi_{t=0}} \tag{3}$$

This case effectively implies an infinitely elastic supply of labour over the relevant range. In stark contrast to the ELS case, here the real wage is fixed, and any demand disturbances will be reflected only in employment changes (over a range).

The ELS and FRW cases represent limiting cases of the responsiveness of the effective supply of labour to the real consumption wage, with elasticities of zero and infinity respectively. The BRW case represents an intermediate case in which the effective (bargaining-determined) level of employment varies positively with the real consumption wage.

While these cases provide a useful range of alternative visions of the UK labour market, recent experience casts some doubt on the current relevance of the BRW or FRW hypotheses, since real wages have been falling despite a fall in the unemployment rate. There is clearly some evidence of a degree of nominal wage inflexibility. Here we illustrate the likely implications of this by exploring the limiting case of a fixed nominal wage (FNW):

$$w_t = w_{t=0} \tag{4}$$

The next section outlines our simulation results.

3. Simulation results

We start by discussing the aggregate long-run results for the FNW-FRW closures since this is a useful benchmark, whose properties are well-known (see Ross et al., (2018) for a detailed discussion). We then outline the main differences between the FNW-FRW, BRW (our default

[6] In the longer-term population and labour supply can, of course, increase through natural population growth. For simplicity we abstraction from that here. Migration flows could also alter labour supply, but we assume that net migration is zero here. However, the fixed real wage model, discussed below, emulates many of the features of a system with endogenous (flow) migration.

model), and ELS closures. This is followed by a detailed discussion of the potential impacts on the energy systems, sectoral results, and a discussion of short-run results.

Table 1: Short and Long-run effects of a 5% increase in international exports. In % changes from base year.

	Long-run			Short-run			
	FRW-FNW	BRW	ELS	FNW	FRW	BRW	ELS
GDP	2.08	0.95	0.23	0.64	0.30	0.19	-
CPI	-	0.75	1.24	0.92	1.09	1.24	1.40
Unemployment rate (pp difference)	-1.80	-0.71	-	-0.98	-0.46	-0.29	-
Total employment	1.91	0.75	-	1.04	0.49	0.31	-
Nominal gross wage	-	1.61	2.68	-	1.09	1.58	2.28
Real gross wage	-	0.86	1.43	-0.91	-	0.34	0.87
Households wealth	1.36	1.06	0.87	0.43	0.50	0.55	0.61
Households consumption	1.46	1.16	0.96	0.70	0.56	0.75	0.83
Labour income	1.91	2.38	2.69	1.04	1.58	1.90	2.28
Capital income	2.35	1.99	1.76	3.84	2.97	2.83	2.43
Government budget	-7.03	-2.42	0.59	-1.00	0.22	0.76	1.55
Investment	2.35	1.28	0.59	3.35	2.46	2.01	1.36
Total energy use (intermediate+final)	2.53	1.72	1.21	1.30	1.04	1.03	0.93
- Electricity	2.03	1.26	0.77	1.16	0.83	0.81	0.68
- Gas	1.98	1.35	0.94	0.81	0.63	0.70	0.68
Energy use in production (total intermediate)	2.36	1.41	0.80	0.79	0.55	0.52	0.42
Energy consumption (total final demand)	2.91	2.44	2.15	1.56	1.49	1.59	1.64
- Households	1.43	1.30	1.21	0.75	0.68	0.92	1.05
- Investment	2.27	1.26	0.60	2.24	1.55	1.40	1.05
- Exports	5.00	4.11	3.53	2.66	2.63	2.55	2.49
Energy output prices	-	0.50	0.82	0.92	0.98	1.06	1.13
Energy intensity (Total energy use/GDP)	0.44	0.76	0.98	0.66	0.74	0.84	-
Territorial CO2 emissions	2.77	1.69	1.00	0.66	0.46	0.43	0.35
Emission intensity (territorial CO2/GDP)	0.67	0.73	0.77	0.02	0.16	0.24	-
Total imports	2.12	2.77	3.19	3.07	3.06	3.28	3.41
Total exports	5.00	3.63	2.75	3.00	2.73	2.49	2.25
Net exports (exports-imports)	-0.19	-0.04	0.06	0.04	0.05	0.09	0.12
- Electricity	2.18	2.27	2.33	2.42	2.25	2.41	2.45
- Gas	2.29	2.46	2.58	2.68	2.53	2.70	2.77

Note: Short- and long-run are two conceptual time periods. The short run (SR) is the period immediately after the introduction of the exogenous shock. Capital stocks are fixed in the SR at industry level. In the long run (LR) capital stocks fully adjust, across all sectors, to the shock, and are again equal to their desired levels. The short-run applies to a period of a year; the adjustment period to the long-run varies but is typically complete within 7-12 years. CO2 Emissions are calculated according to the method given in Allan et al. (2018).

The short- and long-run macroeconomic simulation results for a 5% increase in international exports, reported in percentage changes from base year, across the different labour market closures, are summarised in Table 1.

The adjustments seen in the long-run for the FRW-FNW closures are akin to the results found in IO modelling. With no supply restrictions applying, prices remain unchanged in the long run (McGregor et al., 1996). The long-run results for the FRW and the FNW closures are the same as they both tie down wages in the long-run with no changes in prices.

As there are no changes in prices (CPI remains unchanged from base), there is no crowding out of exports in the long run so that exports increase by the full 5%. The increase in exports stimulates aggregate demand, which increases consumption, investment, and GDP, by 1.46%, 2.35% and 2.08% respectively. Capital stocks rise in the long run by 2.35%, with net investment driven by the gap between the capital rental rate and the user cost of capital that opens in the short run.

The stimulus to investment and enhanced capacity reinforces the expansion (and the impact on employment). This expansion stimulates the demand for labour so that employment rises by 1.91%, and the unemployment rate falls by 1.8 percentage points. Labour income and capital income both rise, by 1.91% and 2.35%, respectively. Export industries tend to be more capital intensive than the aggregate economy, so that the demand for capital increases slightly more than that for labour.

The public sector deficit falls by 7.3% in the long run, a fall from £98bn to £91bn, as tax revenues rise in response to the stimulus to economic activity[7]. Imports increase by 2.12% along with increases in domestic demand. In the base period net exports are negative i.e. the UK economy imports more than it exports. The stimulus to exports thereby decreases the negative trade balance by 0.19%.

When considering the BRW case, the stimulus to the real economy is significantly less (as compared to FRW/FNW) because real wages and prices rise in response to the excess demand for labour. So GDP in the BRW case increases by 0.95%, which is less than half of the 2.08% stimulus under FRW/FNW. The rise in the real and nominal wage pushes up the CPI (by 0.75%), reducing competitiveness and crowding out some of the stimulus to exports, which now rise by

[7] We investigate the consequences of closing the Government budget constraint in the sensitivity analysis in Ross et al. (2018).

only 3.63% in the long run. The rise in consumption of 1.16% is less than under FRW (1.46%), but the decline is mitigated by the fact labour income actually rises more in this case, with the higher real wage more than offsetting the lower employment impact (0.75% as against 1.91%).

Next we consider the ELS case of continuous full-employment. Employment is unchanged, but the real wage and the CPI rise by 1.43% and 1.24%, significantly more than under the BRW (0.86% and 0.75%). This results in much greater crowding out of exports, which now only rise by 2.75%, and a much bigger stimulus to imports (of 3.19%). The sectoral distribution of effects does result in a modest stimulus to GDP of 0.23%, but this is significantly less than under the BRW and FRW-FNW closures.

The short-run impacts are muted given that the capital stock is fixed in the short run both in total and in its distribution across sectors, and prices increase in all cases so that there is some induced loss in competitiveness, and exports are always crowded out to a degree. As anticipated, the GDP (and employment) effects in the short run are ranked as: FNW›FRW›BRW›ELS (and indeed the impact is zero in this case).

These results therefore appear reassuring for the conduct of UK industrial strategy in that key economic indicators move in the desired direction as a consequence of a successful export promotion strategy. However, there are substantial impacts on the energy system, which we now discuss. We focus on the BRW case, our preferred model.

Energy use increases across the board in response to the export stimulus. Furthermore, energy use increases significantly relative to GDP, employment and investment. Energy intensity, defined here as energy use per unit of GDP, increases. In fact, this is true across all labour market models: energy intensity increases significantly as a consequence of a successful export promotion strategy. It appears that exports are thereby rather energy intensive. This is a potentially important spillover from a successful UK industrial strategy to the energy system.

Energy output prices increase by 0.5% reflecting the stimulus to energy demand created by the expansion, as well the increase in labour and material costs.

Figures 1 and 2 summarise selected long-run results at the individual sector level for the 5% increase in international exports, for the BRW. Although we do not discuss these sectoral results in more detail here (see Ross et al., (2018) for a detailed discussion), it is evident that aggregate energy impacts are driven by key characteristics of individual sectors. Although all sectors receive the same percentage export demand shock, sectoral impacts vary significantly because

of their heterogeneous nature. This highlights potential policy trade-offs, particularly at the individual sector level. Increasing exports may generate inadvertent, negative impacts on energy policy goals, if the impacted sectors are also energy intensive.

Given that real wages (and capital incomes) are rising, households experience rising incomes and wealth and so their total consumption - of energy and non-energy goods & services – increases, as we have already noted. Figure 6 summarises the long-run impacts on households' consumption, income, the share of income spent on Electricity & Gas, and non-energy goods & services, across household quintiles, where HH1 is the lowest income quintile. The share of income spent on energy- and non-energy goods and services increases across all Household quintile groups.

The time path adjustments for GDP, employment, and total energy use are detailed in Figure 4. This figure shows how these variables increase throughout all of the simulation periods. Moreover, these results highlight that total energy use increases more than proportionately to GDP, so that there is a significant negative spillover effect from successful export promotion policies to the energy system.

Figure 1: Long-run effects on output, employment, and energy use by individual sectors of a 5% increase in international exports, BRW closure. In % changes from base year.

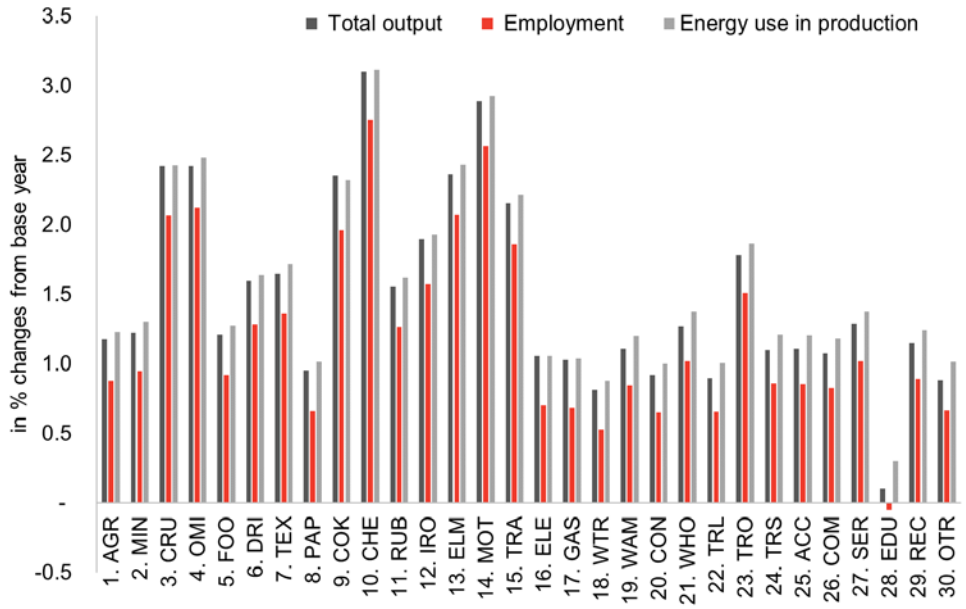


Figure 2: Long-run effects on output price, imports and exports at individual sectors of a 5% increase in international exports, BRW closure. In % changes from base year.

Figure 3 Long-run effects on Household quintiles of a 5% increase in international exports, BRW closure. In % changes from base year.

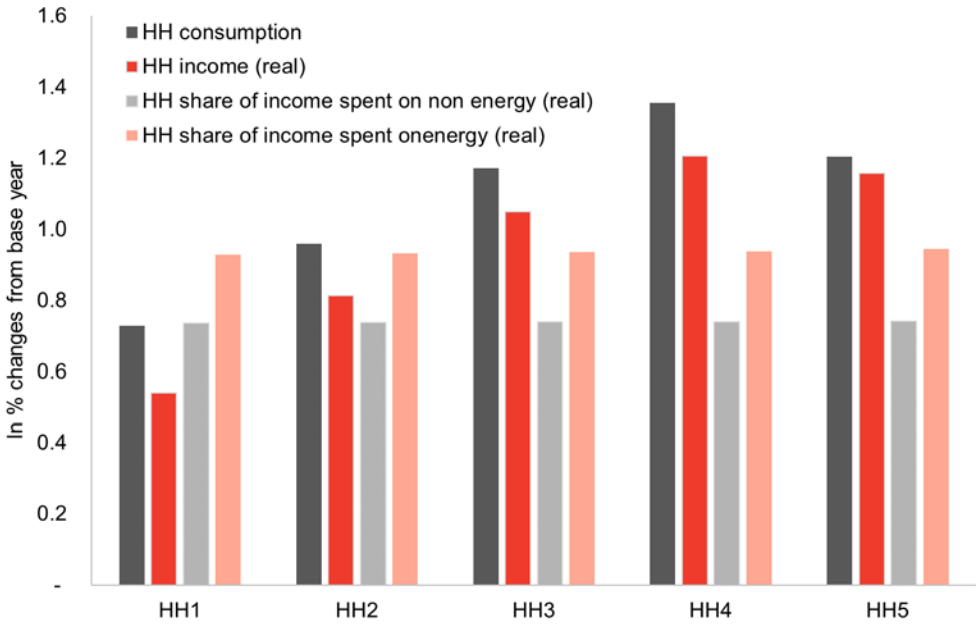
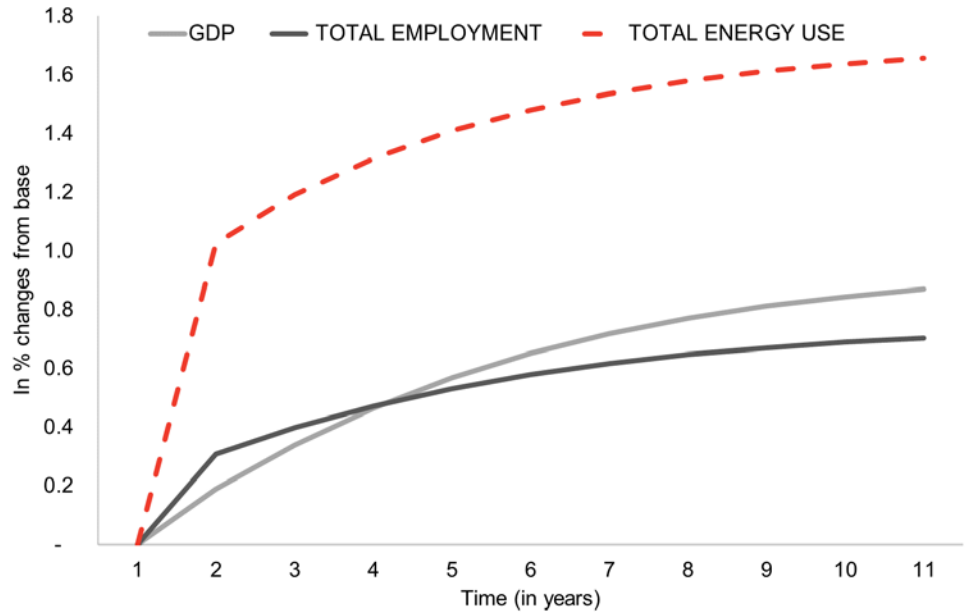


Figure 4 Aggregate transition path for GDP, employment, and total energy use of a 5% increase in international exports. In % changes from base year.



4. Summary & conclusions

The wider impacts of energy policy on the macro-economy are increasingly recognised in academic and policy discussions around the appropriate use of energy policy. For example, recent analyses on energy efficiency policies emphasise the stimulus to economic activity that these typically generate and their potentially beneficial impacts on distributional issues.

However, the potential impact of economic policies on the energy system have been comparatively neglected and, in particular there has been no system-wide analysis of the spillover effects from economic policies to the energy system (Cox et al., 2016). Neglect of such spillovers in policy formulation may lead to inefficiencies and unforeseen conflicts (or complementarities) between energy and economic policy goals. This could be avoided by a more *holistic* perspective.

We begin by analysing the potential impacts of a successful UK industrial, business and innovation policy on the UK analyse the system-wide effects of successful export promotion policies on the energy system. However, since the energy system impacts of such policies are, in large part, transmitted via their impact on the economic system, it is necessary to adopt an

approach that fully captures such interdependence. We do so by employing a UK computable general equilibrium (CGE) model, UK-ENVI.

At one level the results of our analysis may be regarded as re-assuring from the perspective of successful UK export promotion policies in that all the major indicators of UK economic activity, including GDP, employment, consumption and investment are typically significantly stimulated. So the major objectives of UK industrial policy are positively impacted by export promotion.

However, there are significant, and typically *negative* spillover effects to the energy system. Most notably, UK exports are, on average, energy intensive, so that export-driven expansion is associated with a greater stimulus to total energy use than to GDP: hence the energy intensity of economic activity increases as a result. Furthermore, while not modelled here explicitly, this result could translate into increased CO_2 emissions if action is not taken at the same time to decarbonise the economy in line with the Industrial Strategy challenge on Clean Growth. General, across-the-board, export-driven growth is typically not "green" in nature. However, it may be possible to target such policies at specific sectors so as to stimulate "green growth".

Although we do not attempt to investigate the impacts on precise measures of fuel poverty (or poverty in general) we can identify the impact on the share of household disposable income spent on energy and non-energy goods across income quintiles. Our results suggest that the proportion of the lowest household income group's spending on energy increases and so on that basis fuel poverty increases. On the other hand, however, that group's total income and total expenditure on all goods also increase. Other goals of energy policy are similarly adversely affected: affordability (as indicated by an increase in the price of energy) declines, although real incomes actually increase by more than energy prices so that the "real" price of energy and hence affordability is improved.

Energy security is a complex issue with a wide range of indicators (e.g. UK Energy Research Centre, 2018). Here we report that the ratio of imported energy to GDP increases. Some would interpret this as a deterioration in security of supply, although that is controversial and imports can and have been used to augment security (e.g. during the miners' strike). Given this we conclude that the impact of export promotion on security of supply is ambiguous (and will vary depending on the source of imports, supply routes and the mix of sources and fuels). As noted above, fuel poverty and affordability can also be included within the energy security framework.

Overall, it is very clear that, while successful export growth strategies are likely to have the desired effect on the economy and the stated goals of industrial policy, they could have significant negative spillover effects on the energy system and energy policy goals. Neglecting these spillover effects creates a source of inefficiency in the conduct of policy, and a knowledge of their likely scale could be used to develop a more holistic, coordinated approach to policy formation and implementation. For example, pursuit of the Clean Growth Strategy could mitigate/offset any increase in emissions that would otherwise result from an export promotion policy. This would minimise the prospect of conflicts between UK industrial and green growth strategies.

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